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of

New York Air Races

and Start Ford Reliability Tour

VOLUME XIX

NUMBER 14

SPECIAL FEATURES

THE AIR BOARD
ENTRIES FOR THE AIR RACES
THE SHENANDOAH INVESTIGATION
THE START OF THE FORD RELIABILITY TOUR

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The Ford Reliability Tour

WITH the advent of the Ford Airplane Reliability Tour, a new era is opened up in open contest for airplanes Unlike any previous event of this kind, the Ford Tour, in itself, goes to promote, first, the development of reliable commercial airplanes, designed and built solely with a view to their taking an active part in the transportation system of the country Secondly, with the object of encouraging this method of transportation between the major industrial and business centers and thirdly, with a view to accustoming the general populace to the use of airplanes for transportation and traveling purposes

As opposed to the more common class of airplane contest, the Ford Reliability Tour does not demand in any part of its rules the development of high speed The normal cruising speed of the airplane is recognized as amply sufficient to satisfy the demands of express transportation service and the endeavor is rather to encourage the economical operation of airplanes in this respect Thus, merit will be scored by competing airplanes on a basis of cruising speed and economy, paying special attention to the time schedule kept by the planes in their arrivals and departures to and from the numerous cities along the circuit route

Furthermore, in laying out the schedule for the Tour, an endeavor has been made to permit airplanes to remain for a prescribed period at each stopping place in order that persons visiting flying fields may thereby have an opportunity of viewing the planes and associating themselves with the various aspects of coming air transport and, in particular, with any novel features in design which may be incorporated in the planes.

Another most interesting feature of the meeting centering at Detroit, is the first annual Aeronautical Exposition This represents a most complete exhibition of airplanes and parts, accessories and, in fact everything related in any way to airplanes and flying There are forty-five or more exhibitors and, on the whole, as an adjunct to the Tour Meeting, the exposition fills a most important and much needed place.

Aircraft Ascendency

WITH the news of the hearings before the President's Air Board, the thrilling personal accounts of the West Coast-Hawaiian Flight, the Shenandoah enquiry, the Ford Reliability Tour and the New York air races, the public is getting enough aircraft information to satisfy even the most curious

Education always does good Letting in the light on the aeronautical dark spots and demonstrating the utility and reliability of the airplane, will convince the public, if they are not already persuaded, that aerial progress requires the direction of a single agency in the government. The Air Board Report will probably go half way, but Congress, which has the final deciding vote, will probably put its ear to the ground and hear what the public wants rather than take bureaucratic opinions at their face value

The Danger of Official Regulation

AT a time when consideration is being given to the advisability of incorporating in the Department of Commerce a Bureau for the regulation and inspection of civilian and commercial aircraft, it is advisable to look abroad in an endeavor to find precedent and thus gain from the experience of others Although the suggestion of a system whereby safety in flying would be ensured, as far as possible, by the enforcement of logical rules toward this end is commendable it would be extremely serious to the development of the art, should such ruling tie up progress by its short-sightedness

An example of what might happen should red tape creep into the proposed bureau is exemplified in the attitude toward certain engineering developments, of the British Air Ministry, which has control over the inspection of and issuance of air worthiness certificates to all aircraft, either military or commercial. Thus, it is a striking fact that today, in spite of developments in other parts of the world, the Air Ministry continues to lay a complete ban upon all welded steel tube construction, and, in fact, any application of this method of construction to aircraft.

Even if it is granted that this form of construction is, and in some respects it would seem to be, open to criticism, there are so many examples of its successful application that it would seem only natural to expect its encouragement. It must be remembered that this type of construction is the cheapest and most convenient of any so far tried out.

Furthermore, another example of the hindrances to progress which may result from an over application of this principle of official control is to be found again in the same quarter, for the British Air Ministry holds a most conservative attitude in regard to the Curtiss-Reed propeller It is understood that the Fairey Aviation Company, which holds the British rights for this product, is experiencing the greatest difficulties in interesting the powers-that-be in the serviceability and excellence of this propeller It, too, is banned in British aeronautical circles and no airplane fitted therewith has, as yet, been granted an airworthiness certificate, so far as is known This, it will be noted, in spite of the fact that the Curtiss organization and McCook Field have carried out an almost exhaustive series of experiments to determine its strength and aerodynamic advantages and have thereby established each of these

Official inspection and control of the airworthiness of aircraft may have its advantages but let us not be dragged into its becoming an obstacle to developments as appears to be the case across the water

The Air Board's Progress

THE newspapers have given a large amount of space to hearings before the President's Air Board, but they have not told the air people what they really want to know. The question that is invariably asked is as to the possibility of this committee's report being reactionary or whitewashing. If an observer at the hearings with the point of view of airmen can be relied on, the work of the committee will be neither.

Consider the personnel of the committee first. Eight are Republicans, one Democrat. That fact precludes any severe cross examination of members of the Administration. But by the same reasoning, it puts on the members the responsibility of framing an air policy for the government which the President can recommend, the public approve and Congress accept. Of course, such an ideal outcome is not possible, as will be seen from other facts concerning the committee. As a political move, made at a time when the country was aghast at Colonel Mitchell's assaults on the War and Navy Departments it has proved to be a great success. To Acting Secretary of War Davis will go the credit.

Personnel Includes All Groups

Another very important point to be noted about the committee is that all opinions appear to be represented. So set and diverse are these that at first glance, it would appear almost a hopeless task for the members ever to agree on any program.

There is Dwight W. Morrow of J. P. Morgan & Co., a financier who admits that his knowledge of aviation has been limited to what he has read and heard. There is Judge Arthur C. Denison of Grand Rapids, Mich., who pleads guilty to no knowledge of aviation except what he has acquired during the hearings.

Judge Denison at first was the man of mystery. His fellow-members waxing confidential immediately prior to the opening hearing could not understand why the President had named the Judge as a member of their board. They learned the reason.

Judge Denison, according to members of his profession, possesses one of the keenest legal minds on the Federal bench. On many occasions during the inquiry he has been able to clear up a vague or technically involved reply from a witness by putting a simple question, usually through Chairman Morrow.

It is Morrow's position that has lent the hearings almost the same dignity and atmosphere of importance that would have prevailed had the President himself taken the chair. Morrow has been the Chief Executive's friend since college days. That, coupled with his recognized ability and his financial connections, has established the entire investigation as beyond the general run of such hearings.

Senator Bingham is the only pilot on the board. He was a trained civilian aviator before the war, became a colonel and organized the flying training schools, then served in France and came home to win his present position as one of the political figures of the country. During the last summer, the Senator flew on a tour of inspection of the military and naval flying fields. On his return he called upon the President.

He is looked upon as a sort of special prosecutor, representing the Chief Executive and the general public. The old Generals and Admirals recognize in him their best informed opponent on the board. They have read his vitriolic attacks against them in his book, "An Explorer in the Air Service." The majority of flying men accept his idea of creating air branches having the same status as the Marine Corps.

Another aviation expert on the board is Howard Coffin, of Detroit, president of the National Air Transport. It was Coffin who conducted the industrial survey in 1916 which resulted in the formation of the Council of National Defense. He has repeatedly devoted his time and parts of his large personal fortune to the development of Federal aviation.

Coffin was the first president and principal supporter of the National Aeronautic Association and has sponsored many attempts to put over aviation in a practical manner. He is an enthusiastic exponent of air power as the great national asset in war or peace.

While those two members of the board are looked upon as opposing the present system in military and naval affairs, there are two other members of the board whose presence cheers the advocates of the present policy—Major Gen. James G. Harbord, retired, and Rear Admiral Frank F. Fletcher, retired.

General Harbord, now president of the Radio Corporation of America, exhibits a kindly attitude toward the General Staff and the military system he understands so thoroughly. When Harbord was Assistant Chief of Staff under General Pershing he investigated Mitchell and found him not to his liking. The Harbord-Mitchell relations have developed into one of the many personal feuds that are bobbing up in the course of the hearings.

Admiral Fletcher is a battleship man by training and experience. He is considered one of the best officers ever retired from the service. He was one of the relatively few rear admirals to win the post as commander of the fleet. Therefore the Navy has a friend on the board whom it can trust to preserve its interests.

Neutral Positions

Besides Chairman Morrow and Judge Denison three others may be classified as neutrals—with reservations. Dr. William F. Durand is president of the Society of Mechanical Engineers and a member of the National Advisory Committee for Aeronautics composed of Army, Navy and civilian technical specialists.

The Air Service enthusiasts say that Dr. Durand has always been a sincere believer in the big navy idea, which would place him with the advocates of the present policy.

The same is true of the two Congressmen on the board. Representative Carl Vinson of Georgia is a Democrat and a member of the House Naval Affairs Committee. He was chosen so that he may guide his party colleagues when the findings of this board go before Congress for action. He ranks as a thorough examiner into all questions affecting the national defense. At times he betrays no little irritation at the implication of witnesses that conditions might be better were Congress to appropriate more money.

Representative James S. Parker of Salem, N. Y., is chairman of the House Committee on Interstate and Foreign Commerce and one of the Republican leaders. His committee will be called upon to pass on many of the recommendations to be submitted after the inquiry.

With this personnel, the Army and Navy will find that statements such as have been made before Congressional Committees will not be acceptable. General Hines discovered this the first day, when he was asked so many questions that he could not answer without evasion, that his testimony was generally considered a justification for some of the criticism that has been made of the General Staff.

The Navy has, through the poor guidance of Secretary Wilbur been placed in a position that will be more difficult to maintain when verification is asked of some of the statements made. Particularly is this true of Admiral Strauss' attack on the British Air Force and his reports of the British battleship Agamemnon. If someone does not challenge him it will be surprising. The muzzling of Navy officers has been in sharp contrast to the freedom of opinions expressed by the Army officers.

It must not be overlooked that the President's Air Board report will not settle anything. It is merely to lay a foundation for the investigation of the Army and Navy by Congress.

The Start of the Ford Reliability Tour

By W. LAURENCE LE PAGE

September 27th, 1925

ON arrival at Detroit at a time when all were indulging in the customary Sunday morning sleepiness with a very late showing up at breakfast, one found the city bleak and cold and enveloped with rain. Greeted by a very hospitable member of the aeronautical community, one's welcome however, was complete and wholehearted and, for a time the depressing weather conditions were forgotten, and as the morning and early afternoon passed filled with everything which goes to make up a hearty welcome from everyone aeronautical with whom one was fortunate to come in contact, so the weather seemed to rise to the occasion and the sun shone and all was bright and cheerful. With this outlook, a journey was made to the Ford Airport at Dearborn, which was to be the center of great activity on the following day.

Cy Caldwell Arrives

Activity, however, was already in great evidence. Pilots were tuning up engines, gathering together kit and, lastly each having decided upon his selected passengers, weighing in these, the kit and the pilot himself. By four o'clock all but three of the entered planes had arrived and were all but checked and weighed up. During this period four additional airplanes had arrived, however, most apparently having elected to turn up in good time and were on the field by Saturday afternoon. Two airplanes appeared on the horizon and on nearing the airport turned out to be the Glenn L. Martin commercial planes and what enthusiastic greetings were offered up when the long wiry form of none other than Cy Caldwell himself unwound from the cockpit of one of them. Cy was in very good spirits and in business-like manner immediately engrossed himself in the arduous task of gathering kit and weighing in like his fellow tourers had done, and during this time he remained unapproachable.

A Most Interesting Transport

The Fokker three engined FVII monoplane continued to attract great attention during the afternoon and was at all times surrounded by an interested mob, all eagerly taking in the details of this certainly very beautiful design. There are, without the slightest doubt, many features incorporated in the new Fokker with which all American designers would do well to make themselves familiar, for the plane is undoubtedly one of the most notable airplanes ever brought to this country. Its very clean design, the engine mountings for the radial air-cooled power plants and the principle which involves the transmission of all major loads including landing shocks to the large cantilever wing itself noteworthy features, not to mention the importance of the incorporation of the three-engine feature in the plane. This, in itself, goes a very great way in ensuring the safety and reliability of commercial air transportation, and, as Mr. Fokker has apparently realized the use of three comparatively low powered engines renders the economy question in the three engined plane satisfactorily solved.

Late Visitors

Intermittent between other minor attractions such as loading discussions and important decisions in naming passengers for the tour, there were the arrivals of one or two standards from various outlying fields, a silver cross country DH from McCook Field, and as evening fell one repaired back to Detroit under the generous guidance and hospitality of the afore mentioned aeronautical benefactor and, eventually back to the hotel to think over the days happenings.

September 28th, 1925

The morning of the commencement of the Reliability Tour and a fine fresh and brilliant day ahead, which however, dulled off a little later on though not to any serious extent. One's efforts to arrive at the Airport in time to attend a pilots' meeting at 8.00 a. m. were frustrated by an unaccountable last minute dead lock in transportation facilities, but, having overcome this difficulty it was gratifying to find that nothing interesting had been lost and that the meeting, other than being informative in bringing pilots together before the commencement of Tour, was a mere "smoker."

Last minute trial runs of engines with wheels at the chocks occupied most of the time between 8.30 and 9.30 a. m. when all pilots were requested to bring their machines to their proper places and these then arranged themselves in slanting line formation extending along the complete front of the field and in full view of the spectators of which there had arrived a very fine crowd considering that it was a recognized working day and no holiday. Mr. Fokker had ordered special additional mud guard pieces fitted to the two wheels of his plane with a view to preventing the possible damage which might otherwise have resulted from the splashing of the mud, of which there was plenty in evidence, onto the two wing propellers. Mr. Fokker himself seemed little disturbed over the failure of his other entry to reach Detroit from Mitchel Field from which place both planes started out together last Friday. The single engined FVII fitted with a standard 400 hp. Liberty engine had developed engine trouble over the mountains of Pennsylvania and after a forced descent was rendered incapable of flying in the Tour and in fact will be removed from its present position in the hills by truck.

The Starters

The time had arrived for the first starters to be ready and with ticking over engines the three Travel Air machines, designated respectively 0, 2 and 4 indicating, as in the number insignia on all the other entries, the exact time of departure in seconds past the hour from Dearborn and each successive port of call, awaited final instructions for the start. Edsel B. Ford, himself, assisted by Major R. W. Schroeder, sent each plane off on its cross country flight to Chicago by way of Fort Wayne, being the first of the twelve legs of the complete tour which is to carry on during the week.

The Planes Take-off

Each take off was without incident but nevertheless characteristic in itself. All the airplanes were ready on time and up to the starting line with a few minutes to spare. The actual start was interesting in its arrangement in that the planes, leaving as they did at intervals of two minutes, were individually under the close observation of all during their individual departures and careful insight into the respective take-offs of the planes revealed highly interesting details of airmanship, and the flying characteristics of the machines. It should be noted that in no way was the start competitive, the planes taxiing up to where the starters were standing in front of the "Visiting Ships" building and, on the dropping of the white flag, immediately proceeded in their own time to a point some one hunderd feet or so up the field finally turning and taking off down the long leg of the airport right in front of the crowded mass of spectators and over the heads of a considerable mass which had collected at the far end of the field. A sudden change of the wind direction at the last minute, or rather, but an hour before the exact start, rendering it possible for the start to be made in such full view of the spectators.

After the Travel Air machines, which went off with characteristic smoothness and without eventuality, the Junkers monoplane taxied up to the starting line The plane, with the able young Swedish aviator, Frederic Melchoir, who arrived in the United States only last week, in the pilot's cockpit, looked a very robust job as she stood awaiting the signal to start. This airplane is slightly different from the Junkers common in America up to this time, not in general appearance for in this respect it would be difficult to detect any change, but in actual fact the wing span has been increased by what appeared to be some 15 per cent or 20 per cent, although no actual details could be obtained on this point

The Departure of the Junkers

The flag lowered, the plane moved slowly forward and having taken up position proceeded to gain speed down the field but failed to leave the ground at the expected moment but flew rapidly toward the crowded enclosures at the far end of the field To the great and visible relief of all, however, the machine slowly but steadily commenced to climb from the ground but still passed over the heads of the crowd at a dangerously low altitude It would seem that this machine, which, it must be remembered is fitted with an engine rated at but 185 hp, being the German B.M.W. type, though it probably developes more nearly 240 hp, is rather underpowered for the load of seven persons which it is fitted to carry, including the pilot and mechanic The plane probably depends a great deal upon the ground influence for adequate lift for a rapid take off and once off the ground and devoid of its advantageous cushioning effects, the, Junkers rapidly loses lift as the distance from the ground becomes greater. This was so pronounced today, in the take off for the Tour that even after the plane had circled the field and headed off in the correct southerly direction, she disappeared over the "Visiting Ships" building at a very low altitude indeed. However, she was later reported to have reached Fort Wayne satisfactorily and apparently without incident.

Late Ones Arrive

After the Junkers left there was an inevitable wait of some minutes for the two Waco airplanes numbered respectively 8 and 10, had not arrived at the airport and were therefore given up as out of the tour. However, just as the first of the two Swallows, nos 14 and 16, was about to leave at its appointed time of 14 min past the hour, the two Waco planes appeared over the airport and came in, flying in picturesque style, sideslipping across the field like a couple of naughty children rather proud of having stayed out late against 'teachers orders' The two Swallows went off gracefully but without incident, though looking very pretty in blue and silver as they each successively, at two minute intervals sped across the field. The Waco's had completely disappeared, for reasons which became very evident a little later.

Fokker to Go

The next machine to leave was, according to schedule, the Fokker airplane, with Mr Fokker at the control and with pasengers in the cabin No starters were used If engines which start up as promptly as the Wright 200 hp. radials, are always to be used there would seem to be no need for worry, for on each of the very numerous times during the past two days that the engines have been started, there has been no sign whatsoever of any reluctance on the part of the power units to spring to life immediately. Not only is the radial type of engine a very valuable development in the power plant category, but the choosing of Wrights appears to have been a very significant feature contributing to the success of this Fokker plane.

Everyone at the airport was very much impressed with the remarkable take off which was carried out by this plane as she left for the six days' tour. Having left the ground the plane climbed to altitude in a graceful sweeping turn which fascinated everyone, and with that performance disappeared over the trees in the distance.

"Cy" Coldwell is flying a Martin Commercial Model 70, Wright E4 200 hp. engine and will report for AVIATION *the details of the tour in his own incomparable style The pictures of all the other planes will be found in next week's issue*

Good Style from "Casey"

The departure of the Fokker was closely followed by that of the Curtiss "Carrier Pigeon," the standard mail plane type and the design adopted by National Air Transport, Inc., for their preliminary activities, piloted by "Casey" Jones and carrying as 'cargo' in the mail compartment together with the rest of the 'contest load,' Frank Bogart, of the *Detroit News* and H G Gifford The plane, though heavily loaded, took off very well after a very short run across the field and climbed quickly, thus very completely demonstrating its fine qualities as a night or day mail plane, for, only a machine capable of the ground manœuverability and the quick take-off and climb, coupled with the very excellent disposition of the pilot, providing a clear view with very little blind area, can strictly be considered when making a choice of designs for the operation of regular air mail and express routes. The Carrier Pigeon showed very remarkable climbing qualities and took off like a heavy freighter in a remarkably short space and with a very good climbing angle. It was very noticeable how the pilot, Casey Jones to be sure, was confident and at ease in his mount, and how the very fine position of the control cockpit from the visibility point of view, being well up high in the deep fuselage, is a tremendous advantage in a plane of this nature. It was one of the few "tourers" who did not receive a mud bath as they took off from Ford Airport this morning, for the surface of the entire field was in very bad shape from the previous rains and was partially under water and probably had a great deal to do with the difficulties apparently experienced by some of the planes in getting unstuck. Certainly the pilots, and passengers in the open machines, were bespattered with mud as they left the field, a point which might well be given some consideration in the future.

Cy Coldwell followed swiftly on the heels of Casey—or should one say, his tail skid—and went off mid a spray of mud which threatened the propeller blades of all of the entries as they sped down the slushy field

Two Martin Commercials went off, the second piloted by L. B Richardson, following after Coldwell's plane. Each carried a passenger among its contest load and took off well

The Mercury and Ford Leave

The Aerial Service Corporation with which H. C. Mummert is connected, had the Mercury Jr, in the tour and Mr. Mummert himself took it off with good handling in spite of the sticky surface of the ground, followed after the lapse of two minutes by E. G. Hamilton flying the Ford entry, the standard Stout all-metal monoplane, being one of the regular Ford service planes The robust structure of the Stout gives truly a very remarkable impression as the airplane, which is unusually large for a single Liberty engine design, chases down the field As things so worked out, the Ford entry was number 30 and so was due to leave at thirty minutes past 10:00, and this coincided with the scheduled time of departure of the Ford plane to Cleveland As a striking example of the regularity maintained by the Ford express airplane service, the Cleveland plane was taxiing across the field at the same time as the Tour plane went off being 10:30 a. m. to the second Since it would be contrary to the organization of the Ford express airplane service to be off schedule with its airplane departures, it would have been unheard of for the Cleveland plane to wait over a minute or so for the Tour machine to clear, and so it happened that two Stout planes left the airport at the very same second, the Cleveland express speeding off across wind down the short leg of the airport and executing a very graceful and steady take-off, as unnoticed by the crowds as could be, in fact it is extremely improbable that any but those few actually out at the starting point of the Tour saw the Cleveland airplane leave

The Rear Guard

The final three airplanes to leave, the Laird C6 commercial, another Swallow and the Yackey Sport, went off without incident. As the Yackey plane taxied up to the starters No. 5 entry, the first of the two late arriving Waco open touring types, came purring up to the starters, having made good use of the time since its arrival but twenty minutes or so previously in getting weighed in and checked up with a view to getting in the Tour and making up for lost time. The plane, piloted by Ed G. Knepp, was permitted to go off in its own time without ceremony, for its time for the first leg would, in any case, be counted from its proper time of departure, which in this case, should have been 10:08 a. m. So it was a pretty sight to see the Waco and the Yackey Sport, take-off together and disappear over the "Visiting Ships" building in a climbing turn, the Swallow not waiting to circle the field but wasting no time in getting under way. The second Waco, also with the number painted upon its sides still wet, left shortly after the Yackey.

Order of Start

The details of the airplanes in the order in which they left, follows.—

0—Travel Air, flown by B. K. Campbell, and carrying S. A. McGinnis and W B Mueller

2—Travel Air, flown by Francis Bowhan, and carrying Mrs. Charlotte Bowhan and Thomas W. Day

4—Travel Air, flown by Walter W Beech, and carrying Charles E Plaeck

6—Junkers F13, flown by Frederic Melchior, and carrying Ernst Koeppen George Hopkins, F. W Williams, J M. Connolly and J. Otto Scherer

14—Swallow, flown by John Stauffer, and carrying Hart H Bowman.

16—Swallow, flown by Earl Rowland, and carrying J W. Moellendick, president of the Swallow Airplane Co.

20—Fokker three-engine F7, flown by Anthony H G Fokker and E P Lott, and carrying C P Allen, Harry Bruno, R. C. Noorduyn and Harold J Wymer

22—Curtiss Carrier Pigeon, flown by C S. Jones and carrying H. G Gifford and Frank Bogart.

24—Martin No 16, flown by Cy Coldwell, and carrying A. Tomkins.

26—Martin No. 18, flown by L. B Richardson and carrying W J Chapman.

28—Aerial Service Corporation Mercury Jr., flown by H. C. Mummert, and carrying W. C. Chadeayne

30—Stout all-metal airplane, flown by E. G. Hamilton and carrying John Phelps.

32—Laird C6 commercial type, flown by H C Bten and carrying Fred W Koehler

34—Swallow, flown by E. A. Goff, Jr. and carrying T Dale Hopkins.

36—Yackey Sport airplane, flown by Walter J Adams and carrying Charles Priest

8—Waco, flown by Ed. G. Knepp.

10—Waco, flown by L. O. Yost.

Non-Starters

Two planes entered did not start. One, the Fokker F7, entry No 18, which was damaged during a forced landing due to engine trouble over the Pennsylvania mountains, while on the trip from New York to Detroit on Sept 25, and the other, the Huff-Daland, No 5, Duster, which was entry No 12

The airplanes all reached Fort Wayne and Chicago satisfactorily

"Casey" Jones experienced the first ill luck of the Tour on the afternoon of Tuesday, Sept. 29, when, in trying to land the "Carrier Pigeon" on the field at Omaha, Neb, he crashed into a motorcycle and sidecar in the center of the field. No one was injured, but the plane was left standing on its nose. The motorcycle was completely wrecked, though happily a man, who was driving it, jumped from his machine and crawled to safety on his hands and knees.

Jones was being checked in after passing over the finish circle. He circled the field out of the way of the other planes about to land. He immediately gathered about him a volunteer crew, repaired his broken wing and was with the starters the next morning

The New York Air Races

THE International Air Races, which will be held at Mitchel Field, Long Island, N. Y., on Oct 8-9-10, next, have received a total of 176 entries of which 122 are civilian entries and 41 are Army and Navy Air Services and 13 are models. This large entry list undoubtedly heralds a most successful meet from the point of view of the contests. Furthermore the large number of civilian entries is a most favorable sign and shows the extent to which civilian flying is growing.

Below is given a brief summary of the events together with an outline of the rules, prizes and the entrants to date.

Event I-A—On to New York Race

New York Chapter N A A Trophy

Sept. 27 to Oct 7—Competing planes in this event which is open to civilians only, must be flown from any point at a distance of 200 mi. (air line) from Mitchel Field and flights may start at any time during the period named above, arriving at Mitchel Field and presenting the log of the flight any time after 6-00 a. m. Oct. 2 and not later than midnight of Oct. 7. Awards will be made upon average speed, distance covered, passengers carried and engine horsepower. Prizes to the extent of $3,000 will be awarded.

Event I—Free-for-All Race, Two Seater, Low Power Planes

Thursday, Oct 8, 11.00 a. m.—Planes entered in this race, which again, is for civilians only, must have engines of a cylinder capacity not exceeding 510 cu. in. and must carry a total load of 340 lb evenly distributed in two cockpits. Pilots may carry a passenger but it is preferable for ballast to be substituted in lieu of the passenger, although it is specifically stipulated that the passenger's cockpit be left open. The distance of the race is 100 mi., being 20 circuits of a closed course of 5 mi. length. This is a speed race, the winner being the plane around the course in the shortest elapsed time. Planes will be started in groups and the time taken will be that at the moment of the dropping of the starting flag. There will be six prizes, the first being in the form of a trophy and $1,000.

Event 2—Free-for-All Race for Two, Three and Four Seaters

Thursday, Oct 8, 1.00 p. m.—Another race confined solely to civilian entrants, this contest will be for airplanes fitted with engines of cylinder displacement not exceeding 800 cu. in. and all planes will be required to carry a contest load of 340 lb. The race will be over a course of 100 mi., this distance being made up, as before, by 20 times around a 5 mi. course. There will be six prizes totalling $2,500, the first consisting of the trophy and $1,000.

Event 3—Observation Plane Race

Liberty Engine Builders Trophy

Thursday, Oct 8, 3.00 p. m.—A race for observation type two seater airplanes and confined to military and naval entries including any foreign entries which may be placed. The distance to be covered is 150 mi., being made up of 15 laps around a closed course of 12 mi. length. A contest load is to be carried by all planes entered in this race, in addition to the crew, which must amount to 340 lb. in weight, ballast being added to make up this amount where necessary. The contest load is determined by the formula:

$$\frac{400}{1694} \times \text{cu. in. displacement of engine} \times 0.85 = \text{Contest Load}$$

The trophy will be awarded to the Aero Club or the N.A.A. Chapter represented by the winner of the race. There are five cash prizes totalling, $2,500, the first being $1,000.

Event 4—Duration Race for Model Airplanes

Mulvihill Model Trophy

Friday, Oct 9, 9.30 a. m.—A race for model hand-launched airplanes driven by rubber strand motors and open to members of the N.A.A. Junior Flying League. The models must not exceed 40 in. in wing span. Prizes, to the value of $500 together with the trophy, are to be competed for on the basis of maximum duration of flight.

Lieut. Alford J. Williams, U.S.N.
Pulitzer Trophy Race

Lieut. Harmon J. Norton, U.S.M.C.
Pulitzer Trophy Race

Lieut. Cyrus Bettis
Pulitzer Trophy Race

Lieut. K. B. Wolfe, U.S.A.
Detroit News Air Transport Trophy Race

Capt. Harvey W. Cook, U.S.A.
Pulitzer Trophy Race

Capt. E. E. W. Duncan, U.S.A.
Detroit News Air Transport Trophy Race

Event 5—Light Commercial Speed and Efficiency Race

Aviation Town and Country Club of Detroit Trophy

Friday, Oct 9, 11.00 a. m.—This race is for civilians only and an air speed of more than 80 m.p.h. must ha proved to the contest committee to be a possibility for the airplanes entered, while engines are limited to 800 cu. in. piston displacement. The length of the course is 100 mi., formed of 20 circuits of a closed 5 mi. course. Efficiency will be determined from the following formula:

$$\frac{W}{HP} \times M.P.H = \text{Figure of Merit.}$$

W = Contest load (in pounds) of passengers (170 lb each) and 50 lb units of baggage for one or all passengers carried. The pilot (170 lb minimum) may not be counted in this load nor may a unit of baggage be carried for him.

$H.P$ = Horse-power credited contestant = $\frac{\text{cubic inch displacement}}{4}$

$M.P.H$ = Average speed of completing race in miles per hour (must not be less than 80 m.p.h.)

The total load shall consist of pilot and passengers at 176 lb. each or inert ballast in lieu of passengers, also additional load units of 50 lb. to represent baggage may be carried for each passenger. Prizes totalling $2,500 will be awarded in six units, three for each section of the event, both speed and efficiency.

Event 6—Speed Race for Light Airplanes

Dayton Daily News Light Airplane Trophy

Friday, Oct 9, 1.00 p. m.—A race for low powered light airplanes having a maximum engine displacement not exceeding 60 cu. in. The distance is 50 mi. around a closed triangular course of 5 mi. length, the course being covered ten times. Four prizes will be competed for totalling $2,000, the first amounting to $1,000 together with the trophy.

Lieut. John F. Whitely, U.S.A.
Detroit News Air Transport Trophy Race

Lieut. R. L. Meredith, U.S.A.
John L. Mitchell Trophy Race

Lieut. Victor E. Bertrandis, U.S.A.
Detroit News Air Transport Trophy Race

Lieut. John D. Barker, U.S.A.
Detroit News Air Transport Trophy Race

Lieut. Ernest E. Harmon, U.S.A.
Detroit News Air Transport Trophy Race

Lieut. E. G. Carr, U.S.A.
Detroit News Air Transport Trophy Race

Event 7—Race for Large Capacity Airplanes

Detroit News Air Transport Trophy

Friday, Oct. 9, 3:00 p. m.—This race is for military planes only and the stipulations include an airspeed greater than 85 m.p.h., a carrying capacity of 2000 lb. or over, and a total wing spread to exceed 600 sq. ft. Airplanes will carry a crew and ballast to make up 340 lb. and a contest load to be determined from the following formula, using as a basis the cubic inch displacement for the 400 hp. Liberty engine.

$$\frac{400}{1649} \times \text{cubic inch displacement of engine or engines used} \times 2 \text{ lb.} = \text{"Contest Load."}$$

The race will be over a course of 12 mi. to be covered 10 times making up a total mileage of 120. There are four prizes totalling $2,000.

Event 8—Speed and Efficiency Race for Light Airplanes

Scientific American Trophy

Saturday, Oct. 10, 11:00 a. m.—This race is for civilian entrants only and the airplanes must have an engine displacement not to exceed 80 cu. in. and must carry a load of 150 lb., including the pilot. The race is over a distance of 50 mi., ten times around a triangular course of 5 mi. length. The winner of the efficiency section of the contest will be the pilot who has completed ten laps of the course (50 mi.) with the highest figure of merit according to the following formula, providing the pilot places in one of the first four positions in the speed portion of the contest.

$$\text{Figure of merit} = \frac{\text{Speed of completing race in m.p.h.}}{\text{Gasoline consumed.}}$$

The gas tank seal will be broken by the Contest Committee on completion of the race, and each plane will be credited with a gas consumption equal to the amount required to completely refill the tanks.

Four prizes are to be awarded for each section, making up a total value of $2,000, the first prize of the speed section amounting to $600, while that of the efficiency section to $400.

Lieut. Christian F. Schilt, U.S.M.C.
Detroit News Air Transport Trophy Race

Lieut. Samuel P. Cinder, U.S.N.
Detroit News Air Transport Trophy Race

Lieut. Troy N. Thweatt, U.S.N.
Detroit News Air Transport Trophy Race

Major Herbert A. Dargue, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. F. O. Rogers, U.S.M.C.
Liberty Engine Builders Trophy Race

Lieut. Thomas P. Jeter, U.S.N.
Liberty Engine Builders Trophy Race

Event 9—Race for Pursuit type planes

John L. Mitchell Trophy

Saturday, Oct. 10, 1:00 p. m.—This race is specifically for pilots of the First Pursuit Group, Army Air Service, and consists of a straight speed race over a distance of 120 mi. around a closed course of 12 mi., this course to be covered ten times. The prizes consist of three cups for the pilots of the first, second and third planes in the speed contest.

Event 10—The Pulitzer Trophy Race

Saturday, Oct. 10, 3:00 p. m.—High speed airplanes of the racing type are entered in this event which is open to all and in which foreign entries are expected. Competing planes must prove an air speed greater than 175 m.p.h. and the landing speed is not to be higher than 75 m.p.h. The conditions under which airplanes are entered in this race are very exacting in order that the possibilities of structural failure may be reduced to a minimum. The following conditions are to be complied with in this respect:

Load factor as loaded for start of race.

Wings

7½ High incidence condition with center of pressure at its most forward position.

5 Low incidence condition with center of pressure at location corresponding to maximum ground speed

4 Reverse load condition

Fuselage:

7 Flying and landing loads.

The strength values for wood as given by the Forest Products Laboratory for 10 per cent moisture content and the Army method of stress analysis shall be used in making all strength calculations.

The race is over a course 200 km. (124.27 mi.) in length and is to be covered in four laps of a closed triangular course of 50 km. (31.07 mi.). Four prizes, in addition to the trophy, are up for competition and total $4,000 in value, the first prize being $2,000.

Lieut. Martinus Stenseth, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. George R. Henderson, U.S.N.
Liberty Engine Builders Trophy Race

Lieut. H. C. Kinkaid, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. V. H. Strohm, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. E. B. Bayley, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. W. B. McCoy, U.S.A.
Liberty Engine Builders Trophy Race

EVENT NO. 1A

Pilot	Plane	Starting Place
Albin K. Peterson	Bellanca CE2	Washington, D. C.
Robert E. Fogg	Lawson MT2	
Harry J. W. Hiles	Waco 9	
Charles A. Lindbergh	Lincoln Standard	Gethamberg, Nebr.
Eldred L. Renelin	M2K1 Monoplane	
A. B. Kreider	Bellanca CE2	Bellywood, Calif
D. A. Askew	Canadian Curtiss JN	Hagerstown, Md
Basil L. Rowe	Thomas-Morse S4E	Ardmore, Okla.
Russell W. Simpson	Orenco F4	Keyport, N. J.
Nathaly A. Gathmaw	Oriole Sikorsky	Undesignated
Joseph A. Fancher	Powell Racer	
Robert P. Howitt	Waco 9	Detroit, Mich.
Louis A. Meier, Jr.	Meier Special	
L. W. Bonney	S.V.A. Biplane	Undesignated
Hart G. Smith	Standard Hispano	Undesignated
Jack Laase	Hartzell FC2—3 Place	Dayton, Ohio
Fred A. Pierce, Jr.	Comet Commercial	
Joseph Hammer	Alexander Eaglerock	Denver, Colo.
Daniel Klaer	Converted T.M. B Scout	
Clyde Emrich	Johnson Rumble Bee	Dayton, Ohio
Keith E. Gillette	Sikorsky Messenger	Undesignated
M. Waishaner	Thomas Morse Scout converted	Undesignated
Boris V. Sergievsky	JN4 Sikorsky	Palmyra, Pa.
Walter L. Brock	Brock Monoplane	
Lloyd O. Yost	Waco 9	Paterson, N. J.
Marie A. Maltrup	Mayes-Oriole	
Wright Aeronautical Co.	Wright Bellanca	Chicago, Ill.
L. A. Krause	Curtiss Oriole	
Roy Ahearn	Standard Hispano	
Clarence D. Chamberlain	Bellanca CE2	St. Louis, Mo.
Mark I. Ashley	Laird Commercial	Chicago, Ill.
E. M. Laird	Laird Commercial	Lansing, Mich.
Arthur J. Davis	Thomas-Morse-OX5	
H. H. Wixon	Wixon Monoplane	
Ross Turner	Brequet Biplane	Sheffield, Ala.
Walter H. Beech	Travel Air Model D	
Kenneth W. Montee	Montee Biplane	Santa Monica, Calif
H. C. Mummert	Aerial Service Biplane	Undesignated
John D. Brock	Waco Biplane	Kansas City, Mo.
Curtiss Flying Service Inc.	Curtiss Lark	Garden City, L. I.
"Tex" La Grone	Waco	Kansas City, Mo.
Stanley Wallace	Spad Sport-OX5	Chicago, Ill.
Herbert L. Kindred	JN4C	Temple, Tex.
C. S. Jones	Curtiss Oriole	Undesignated
Huff Daland Co.	Duster Model 5—Petrel Duster	

Lieut. Ray H. Clark, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. Homer B. Chandler, U.S.A.
Liberty Engine Builders Trophy Race

Lieut. Clyde K. Rich, U.S.A.
John L. Mitchell Trophy Race

Lieut. Alfred J. Lyon, U.S.A.
John L. Mitchell Trophy Race

Lieut. Frank O'D. Hunter, U.S.A.
John L. Mitchell Trophy Race

Lieut. George F. Schulgen, U.S.A.
John L. Mitchell Trophy Race

EVENT NO. 1

Pilot	Plane	Address
Albin K. Peterson	Bellanca CE2	Washington, D. C.
Basil L. Rowe	Thomas-Morse S4E	Keyport, N. J.
H. J. Laase	Hartzell FC2	Dayton, Ohio
Alex. P. Krupsh	Sikorsky "Messenger"	Westbury, L. I.
Wm. H. Emery, Jr.	Travel Air—3 place	Bradford, Pa.
Boris V. Sergievsky	JN4—Sikorsky Wings	Westbury, L. I.
Joseph Hammer	Alexander Eaglerock	Denver, Colo.
Walter B. Beech	Travel Air Model B	
A. H. Kreider	Waco 9	Hagerstown, Md.
G. S. Ireland	Ireland Comet	Garden City, L. I.
E. M. Laird	Laird—3 place	
Robert F. Hewitt	Waco 9	
Kenneth W. Montee	Montee Biplane	Santa Monica, Calif
W. L. Gilmore	T.M. S4B Modified	Garden City, L. I.
Clarence D. Chamberlain	Bellanca CE2	
Curtiss Flying Service	Curtiss Lark	Garden City, L. I.
Fairchild Flying Corp.	Waco 9	
"Tex" La Grone	Waco	Kansas City, Mo.
Chief Rowhan	Travel Air Model A	
Emil H. Borgin	Oriole-Sikorsky Wings	

EVENT NO. 2

Pilot	Plane	Address
Albin K. Peterson	Bellanca CE2	Washington, D. C.
Curtiss Flying Service	Curtiss Oriole	Garden City, L. I.
Basil L. Rowe	Thomas Morse S4E	Keyport, N. J.
Basil L. Rowe	S.V.G.	
C. E. Pyle	Laird Commercial	
E. M. Laird	Travel Air Model D	
Walter Beech	2-Seater Meier	Garden City, L. I.
Louis A. Meier, Jr.	Wright Bellanca	
Frederick H. Becker	Curtiss Oriole	
L. A. Krause	Ireland Comet	Garden City, L. I.
G. S. Ireland	Mayer-Oriole	
Marie A. Maltrup	Thomas-Morse S4B	
W. L. Gilmore	Aerial Service	Hammondsport, L. I.
H. C. Mummert	Sikorsky S31A	Garden City, L. I.
Fairchild Flying Corp.	Curtiss Lark	
Curtiss Flying Service	Curtiss Oriole	
C. B. Jones	Pitcairn Aviation PA1	
Jas. G. Ray		

EVENT NO. 3

Pilot	Plane	Address
Capt. Pelletier-D'Oisy	Brequet Type 19	France
Captain Lemoitre	Brequet Type 19	France
Maj. H. A. Dargue, U.S.A.	DH4B	Office, Chief of Air Service
Lieut. E. P. Gaines, U.S.A.	CO6	Fairfield, Ohio
Lieut. E. R. McKeynolds, U.S.A.	DH4B	Holling Field
Lieut. H. B. Chandler, U.S.A.	DH4B	Mitchel Field

Lieut. Thomas K. Matthews, U.S.A.
John L. Mitchell Trophy Race

Lieut. Charles D. McAllister, U.S.A.
John L. Mitchell Trophy Race

Capt. T. E. Tillinghast, U.S.A.
John L. Mitchell Trophy Race

Lieut. R. H Clark, U.S.A.	DH4B
Lieut. W. R McCoy	DH4B
Lieut. E. B Bayley, U.S.A.	Douglas KO2
Lieut. V. H Strahm, U.S.A.	DH4B
Lieut H C Kincaid, U.S.A.	DH4B
Lieut. M Stenseth, U.S.A.	DH4B
Alternates	
Lieut. J D Williams, U.S.A.	
Lieut. J. N Parker, U.S.A.	
Lieut T P Jeter, U.S.N	Boeing O2B1
Lieut G R Henderson, U.S.N	Boeing O2B1
Lieut. F C Rogers, U.S.M.C.	DH4B

Event NO 4

Designer	
Bertram Pond	Fort Bliss
Eugene J Docherty	Brooks Field
Warren H DeLancey	Crissy Field
Arthur O Heninrich	Middletown, Pa
Walter L Brock	Maxwell Field
Paul Shiffer Smith	Minneapolis, Minn
Harold McMickle	
Daniel I Dwyer	Rockwell Field
Joseph J. Lucas	
Donald Lockwood	Indianapolis, Ind
Nathan Feldman	Anacostia, Md.
Harold L Laird	Anacostia, Md
W. E. Schweitzer	Anacostia Md

EVENT NO 5

Pilot	Plane	Address
Curtiss Flying Service	Curtiss Oriole	Peru, Ind.
C. S. Jones	Curtiss Oriole	Chicago, Ill.
Cedric E Fyle	MK1 Monoplane	Agawam Mass
Basil L Rowe	Thomas-Morse S4E	Baldwin, L. I
Russell W. Simpson	Orenco F4	Chicago, Ill.
Wright Aeronautical Co.	Wright-Bellanca	Chicago, Ill.
Emile H Burgin	Oriole-Sikorsky	Brooklyn, N Y.
Joseph Hammer	Alexander Eaglerock	Dayton Ohio
G S Ireland	Ireland Comet	Chicago Ill.
H. C Mummert	Aerial Service Biplane	Chicago Ill.
L. A. Krause	Curtiss Oriole	Brooklyn, N Y.
Curtiss Flying Service	Curtiss Lark	Garden City, L. I.
Richard H Depew	Sikorsky S31A	Paterson, N. J.
Curtiss Flying Service	Curtiss Oriole	
E. M. Laird	Laird—3 place	Denver, Colo.
"Pat" Le Grows	Waco	Garden City, L. I.
Clarence H Powell	Powell Racer	Hammondsport, L. I.
Merle A. Moltrup	Curtiss C8	Garden City, L. I.
Heath Airplane Co	Hummingbird Mono plane	Garden City, L. I.
Carter Tiffany	Tiffany Light	Kansas City Mo
Wallar H Beech	Travel Air Model D	Detroit Mich.
E Dorney	Dormoy	
H C Mummert	Mummert Light	Chicago, Ill
Jas C Eay	Pitcairn Aviation PA1	
J B Faulkner	Pitcairn Aviation PA3	Freeport, L. I.

EVENT NO 6

Pilot	Plane	Address
Joseph A Fancher	Powell Racer	Dayton, Ohio
Clyde Ernick	Johnson Bumble Bee, Type M	Garden City, L. I
Edward B Heath	Linstead Hummingbird	Philadelphia, Pa.
Carter Tiffany	Light Plane	Philadelphia, Pa
E Dorney	Dormoy Monoplane	
H. C Mummert	Mummert Monoplane	
M H Wixon	Wixon Monoplane	

EVENT NO 7

Pilot	Plans	Flying Field Address
Lieut. K. B Wolfe, U.S.A.	C1—Douglas Transport	Brooks Field
Capt. E. E W. Duncan U.S.A.	C1—Douglas Transport	Langley Field
Lieut. J F Whitely U.S.A.	C1—Douglas Transport	Langley Field
Lieut. C L. Williams, U.S.A.	Martin Bomber	Langley Field
Lieut H. A. Johnson, U.S.A.	Martin Bomber	McCook Field
Lieut V. E. Bertrandias, U.S.A.	C1—Douglas Transport	McCook Field
Lieut. J. D. Barker, U.S.A.	Martin Bomber	Phillips Field
Lieut J D Barner, U.S.A.	Martin SC8	
Lieut. L J Corr, U.S.A	C1—Douglas Transport	Kelly Field
Lieut O Moss, U.S.A.	C1—Douglas Transport	Kelly Field
Lieut. E E Harmon, U.S.A.	Huff Daland	Office, Chief of Air Service
Capt L. M. Beams, U.S.M.C	Martin Bomber	
Alternates		
Lieut. B S Thompson, U.S.A.	C1—Douglas Transport	Phillips Field
Lieut. D L. Bruner		McCook Field
Lieut S. T. Ginder, U.S.N	Douglas DT4	East Coast Scouting Fleet
Lieut C F Schilt, U.S.N.C	Douglas DT4	Quantico, Va
Lieut. Troy E Thweatt, U.S.N	SC8	Hampton, Roads Va
Lieut. Clifton A. F Sprague, U.S.N.		Anacostia, Md

EVENT NO 8

Pilot	Plane	Address
Joseph A. Fancher	Powell Racer	
Clyde Ernick	Johnson Bumble Bee, Type M	
Edward B Heath	Linstead Hummingbird	
Carter Tiffany	Evans Light Plane	Freeport, L. I.
E Dorney	Dormoy Monoplane	Dayton, Ohio
H. H Wixon	Wixon Monoplane	
H C. Mummert	Mummert Monoplane	Hammondsport, N Y.

EVENT NO 9

Pilot	
Capt T E Tillinghast	
1st Lieut. Russell L Meredith	
1st Lieut Frank O D Hunter	
1st Lieut. Alfred J. Lyon	
1st Lieut Thomas K. Matthews	
2nd Lieut. Chas D McAllister	
2nd Lieut. Robert W. Douglas	
2nd Lieut. Clyde K. Rich	
2nd Lieut. Russell J Minty	
2nd Lieut George F Schulgen	

EVENT NO 10

Pilot	Plane	Flying Field Address
Lieut. Cyrus Bettis, U.S.A.	Curtiss Racer	Selfridge Field
Alternate		
Lieut J H. Doolittle, U.S.A.		Boston, Mass
Capt Harvey W Cook, U.S.A.	Curtiss Pursuit	Langley Field
Lieut L H. Dawson, U.S.A.	Curtiss Pursuit	Chanute Field
Lieut A J Williams U.S.N.	Curtiss Racer	Anacostia, Md
Alternate		
Lieut George T Cuddihy, U.S.N	Curtiss Racer	Anacostia, Md
Alternate		
Lieut F. H Conant U.S.N		Naval Bureau of Aeronautics
Lieut Cyrus Bettis U.S.A.	Curtiss Racer	
Lieut H. J. Norton, U.S.M.C	Curtiss Pursuit	

Lieut. Russel J. Minty, U.S.A
John L. Mitchell Trophy Race

PN-9 No. 1 Again in the Air

The transpacific seaplane, PN-9 No. 1, the wings of which have been repaired at the Pearl Harbor Air Station, made a successful test flight of four hours duration on Sept. 19. Six men were assigned to fly, but report has it that three others had stowed themselves away in the plane, such was the eagerness which prevailed for the experience of a flight in the seaplane which carried Commander Rodgers and his crew from San Francisco to the Hawaiian Islands.

While the seaplane was in the air, radio messages were sent to the Navy Department in Washington and to Commander Rodgers aboard the U.S.S. Idaho, en route for San Francisco, telling of the flight.

New Planes for Pulitzer Trophy Race Indicate America's Strength in the Air

By C. M. KEYS
President Curtiss Aeroplane & Motor Company, Inc.

These questions are often asked by Congressional investigating committees and individuals?

Of what value are racing airplanes?

How do they figure in our national program?

The latter question might be answered first. As yet we have no national program. It is something that we hope will result from the present investigation authorized by President Coolidge.

The Pulitzer Trophy Race to be held at Mitchel Field, L. I. on Oct. 10 may show the value of racing planes. To the average person the sight of a man in a winged machine being hurled through space at the terrific speed of 400 ft. a second or more provides a thrill—and that is all. He glows with pride if another world's record is broken and lets it go at that.

To those charged with our national defense in the air, however, this breaking of records is of vital importance. It indicates our potential strength in the air if we should be drawn into another war.

For five years the Pulitzer contest has afforded an opportunity for engineers to try out their latest ideas relative to pursuit types. It is virtually a competition in aircraft engineering for this class of plane.

Policy Produces One Constructor

All six entries in this year's race were designed and built by the Curtiss Company, a fact that is mentioned here not as a reflection on other airplane constructors but rather by way of explanation. The apparent lack of competition is not due to lack of interest or engineering initiative elsewhere in the industry but because of the lack of a federal aviation policy.

The tremendous cost of designing and building new types precludes the possibility of any constructor producing a plane to race for the sole pleasure of seeing his creation in the air. Airplane construction is too expensive for that. The trend throughout the industry has been for each constructor to specialize in certain types, one factory producing heavy bombing machines, another light patrol, scouting or reconnaissance planes, each of which has its own peculiar characteristics.

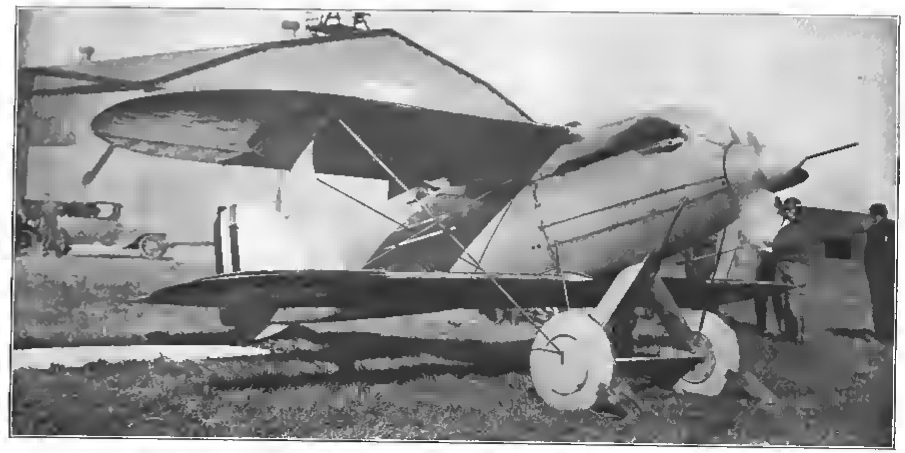
As yet no manufacturer has been able to procure sufficient business from the Government to warrant strict adherence to that policy, yet he would like to adhere to it if he could. He would like to see the Government adopt a procurement policy which would permit every responsible builder in the country to confine his research and development work to certain types. We hope that such a system will be incorporated in a policy if it develops from the present investigation. It would remove from the industry much of the uncertainty and financial losses which have been its lot since the armistice.

While the Curtiss organization has not been able to specialize on any one type of plane, it has been led by circumstances to work with the Government services in the development of racers to a greater extent than the rest of the industry combined.

First Prize Winner

The first Pulitzer contest was won by the Army Air Service with a machine designed at McCook Field, the air service technical center at Dayton, Ohio. There were no real competitors, for no other machines had been ordered for the race. The following year Navy aviation officials, desiring to develop standard pursuit planes, ordered the first Navy-Curtiss racer to be built around a new engine which we had developed to take the place of the famous French Hispano-Suiza which had been the outstanding pursuit engine during the war.

That task fell to us because we had managed to keep our engineering staff intact during the post-war readjustments. The Curtiss Company had the best wind tunnel and other laboratory facilities existing in American aircraft plants. Our engineers have been able to predict, with absolute accuracy, the speed, stability and flying qualities of each new airplane designed, before building it. That means a great deal when the Government is investing from fifty to a hundred thousand dollars in a new type of flying machine which is experimental at best.



The 1925 Curtiss Racer on test at Mitchel Field, L. I.

That first Navy-Curtiss racer won the second Pulitzer contest held at Omaha in 1921, making an average speed of 176.7 m.p.h. over the course. This was faster than any person had ever flown in a race. It led both the Navy and Army to encourage the development of the Curtiss engine. Both branches decided to go the limit in the development of pursuit planes.

Six different companies built racers for the third Pulitzer race held in Detroit in 1922. The Army had two Army-Curtiss racers. The Navy had two new Navy-Curtiss racers which had been redesigned from the winning plane of 1921. That race was a turning point in international aviation. Theretofore, France, England and Italy had held the world's speed records, meaning that they were producing faster machines

Air Service officials were quick to take advantage of their opportunity to continue this development. They ordered us to develop standard pursuit planes for their service. By means of the racers our engineers were able to check up the many qualities which enter into a superior fighting plane. A race is the most grueling test that can be applied to a machine. The throttle is opened wide throughout the race. Every weakness in an engine and plane appears during the contest, and the practicability of all innovations is tested thoroughly.

From the Army-Curtiss racers of 1922 were developed the standard pursuit planes used last year, when Lieutenant Maughan flew one of them from New York to San Francisco in a single day, making the 2670 mi. in 21 hr. and 48½ min., including stops for fuel and despite fogs, terrific headwinds

The Curtiss Pursuit plane, model PW8A (460 hp. Curtiss D12 high compression engines similar to machines entered in this year's Pulitzer Trophy Race

At Detroit the Army-Curtiss racers came in first and second, the Navy-Curtiss racers third and fourth. Admittedly, the reason why those four ships won against a field of fifteen entries was because of our previous experience in designing this type. The same engineering staff, the same skilled workmen had been in charge of design and construction since the war. They are there today. The winner, Lieut. Russell Maughan, averaged a speed of 205.8 m.p.h. over the Pulitzer course, taking world's records for both 100 and 200 km. A few weeks later his plane took the world's speed record over a straight course at 222.97 m.p.h. This was vitally important to all Americans. Public confidence in American aircraft, which had been weakened by the reports of airplane progress in Europe, was immediately strengthened. When the records were brought here the morale of the army and navy aviation personnel was bolstered up considerably. Our aviators then were sure that there existed here the engineering and construction background which, if given an opportunity, would provide them with flying equipment second to none.

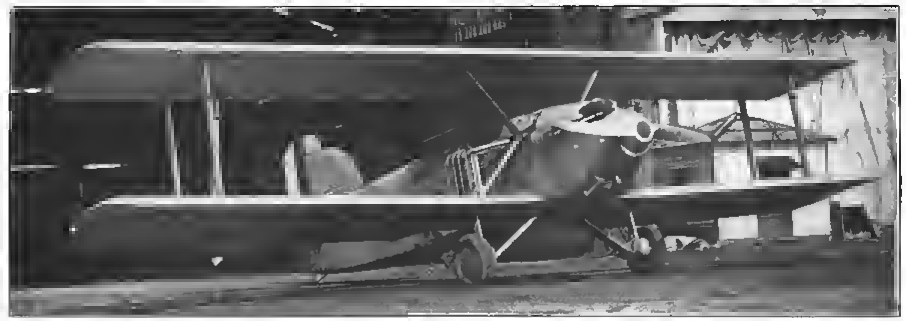
and the necessity of flying at 9,000 ft. over the Sierra Nevada Mountains.

Last winter the First Pursuit Group of the Army Air Service, equipped with the same type of plane, conducted the most remarkable tests in the history of that branch of military aviation.

Pursuit Planes on Skids

The landing wheels were removed and skids put in their place. The entire squadron took off from Selfridge Field, Mich., in zero weather and flew about 125 mi. to Lake Van Etten, landing on the wind-swept ice. The squadron was without rail facilities or transport other than that supplied by a large homing plane which was flown back and forth with supplies of food, fuel and ammunition; yet the group operated every day for a week, carrying out a technical program against a theoretical enemy on the northern border.

The Navy Douglas DT6 entered in the International Air Races



Douglas DT4 Bomber entered in Liberty Engine Builders Trophy Race equipped with Wright T2 engine

Then the squadron returned to Selfridge, removed the skids and replaced the wheels and flew from Selfridge to Miami, Fla. and back. These tests proved conclusively that our advanced fighting forces could be equipped to operate anywhere in the country despite diversified climatic conditions. They proved that the engines, propellers and planes could stand up under zero weather or tropical heat.

Meanwhile we had done equally well with over-water flying. In September 1923 the two Navy-Curtiss racers, mounted on pontoons, took first and second place in the Schneider Maritime Cup Race at Cowes, England, and established the world's seaplane record for the 215 mi. course at 177.3 m.p.h. That performance inspired the English press to refer to the planes as "the most perfect example of racing aircraft yet seen in Europe." It was a good thing for the prestige of American aviation

New Racers in 1923

The Navy carried off the honors in the Pulitzer race held in St. Louis in 1923. Two Navy-Curtiss racers were built, embodying all late improvements, including the Curtiss D12A engine, which had been steadily improved for three years until it had become a standard engine for the air services. In the race Lieut. Alford J. Williams, chief of the Navy team this year, won first place. He piloted his machine over the course at an average speed of 243.8 m.p.h., and Lieut. Harold Brow was a close second in his twin racer, both pilots breaking all records for speed. Later they made 288.59 m.p.h. on a straight three kilometer course. That world's record stood from October 1923 to December 11, 1924, when Bonnett claimed it for France after making 278.48 m.p.h. at Istres.

Last year that same type was redesigned and further improved, developing into a new Navy-Curtiss racing seaplane to defend the Schneider Cup in the 1924 race which was to be held at Baltimore. The non-entry of foreign machines caused the cancellation of the race, but the plane in its acceptance trials made 226.9 m.p.h., thirty miles faster than the winner in the over-water classin the previous year. This plane is the second Navy entry in the Schneider Cup race to be held at Baltimore on Oct. 24, when it will be matched with the fastest seaplanes that Europe can send here.

Neither the Army nor the Navy ordered new racers for the Pulitzer race in Dayton last year, both branches devoting their funds to service craft. No extraordinary high speeds were made in last year's contest because of the absence of new planes.

The Pulitzer contest this year should therefore indicate the engineering development during this two year's period, which has elapsed since the last new racers were built. This period has also developed another crisis in federal aviation. When President Coolidge appointed his committee to investigate the needs of aviation, one of the chief problems he had in mind was the creation of a Government policy which should enable the industry to maintain itself and be ready to supply the military equipment required in war.

The industry has not been maintained since 1918. It has shrunk to an utterly inadequate size. Capital has been withdrawn wherever possible and no capital, or very little of it at least, has been invested. Yet it is a key industry necessary to the national defense. It is one of the most highly skilled in the country. Our workmen are thoroughly trained and competent for specialized work. To maintain facilities for building aircraft they must be kept on the payrolls continuously. We cannot discharge them and later on, when we receive a small order, go out and hire new hands. Yet no airplane factory has had enough business to keep its personnel employed.

The development of the Curtiss pursuit engine is a case in point. That engine had powered the record-breaking planes and had been adopted as standard by the federal services. Yet the last engine ordered by the Government left the factory in June 1924 and repeat orders were not forthcoming for six months or more. We could not dismiss our motor force. We kept them on the payroll and built a few engines at our own expense. Later, we sold some of them to England, France and Czecho Slovakia. Meanwhile, we improved the engine until a new model had been developed.

The CS entered in the Liberty Engine Builders Trophy Race

This new model, the Curtiss V-1400, powers the two new racers, twin planes which Army and Navy pilots will fly against each other in the Pulitzer contest. It marks an important development in pursuit motors. It is of the same outside dimensions and weighs thirty pounds less than the other, the D12 which carried former racers to victory. Notwithstanding the similarity in size and lighter weight the new

engine develops 619 hp., a twenty per cent increase in power. The engine and propeller are two of the most important factors in determining speed.

The new propeller on the racers is the invention of S. A. Reed. It was developed in our factory and has been termed one of the most important contributions to aviation since the war. It is made of forged duralumin, supplanting the old wood and glue propeller which could not withstand the strain of fast flying, nor rapid changes in temperature. Had we gone to war with Mexico before this metal air screw was perfected, we should have been compelled to build propellers on the Rio Grande to insure efficiency in that climate.

The duralumin propeller is not subject to temperature changes, will not break in rain, hail or high grass. In the racers it will be whirling at 2,500 r.p.m. and is so pitched that with each revolution it forces the plane forward ten feet, this not allowing for slippage which is slight in racers.

There are a number of other improvements in the airplane itself which are calculated to add to its speed. Some of them must eventually be incorporated in the military pursuit craft which will be developed from the new racers.

The four other entries in the contest are standard Curtiss pursuit planes. They will be flown by Army and Navy pilots. While they will not make the speed that the racers will attain, they will show the relationship between the two types. They should also demonstrate the need for constant improvement in both engineering and construction if we are to keep abreast of other nations. That, of course, is predicted on the early adoption of a Government policy, one that will look upon aviation as a thing to be kept alive on an efficient low cost and continuous basis. Such a policy can only be brought about by a definite program authorized by Congress.

The S.A.E. Aeronautic Meeting

The latest available information on airplane design, construction and operation will be presented in a number of addresses to be delivered at the national Aeronautic Meeting and dinner to be held by the Society of Automotive Engineers at the Hotel Astor, New York, during the afternoon and evening of Oct. 7, the day preceding the Pulitzer Prize Races at Mitchel Field, Long Island.

The afternoon session is to be devoted to papers and discussion on the design and construction of racing and commercial planes and engines, and at the evening session following the Aeronautic Dinner, the operation of aircraft in commercial air lines will be the subject of several addresses. The speaker at the dinner will be C. M. Keys, president of the Curtiss Airplane & Motor Co., while Harry L. Horning, president of the Society, will preside and Henry M. Crane, of the General Motors Co. and past president of the Society, will be toastmaster.

The president of the Aero Club of France, Monsieur P. E. Flandin, and Monsieur Louis Breguet, a prominent French airplane manufacturer, have accepted an invitation to attend the sessions and the dinner. The meeting is open to all persons seriously interested in aeronautics.

The meetings, which opens at 1:30 p. m. is to be divided into two sessions. The Design and Construction session will incorporate the first four papers named above together with a discussion upon each. This session will be followed by the Aeronautic Banquet at 6:00 p. m. The second session, devoted to Operation, opens at 8:00 p. m., and will include the final three papers, which deal exclusively with commercial operations of aircraft.

The papers to be delivered, and their authors, are as follows: The Aeronautical Safety Code, Its Object and Meaning, by Henry M. Crane, General Motors Co.; Evolution of the Racing Plane, by W. L. Gilmore, Curtiss Airplane & Motor Co.; Some Aspects of Aircraft Engine Development, by George J. Mead, Pratt & Whitney Aircraft Co.; The Light Airplane and Low Powered Flying, by W. Laurence Le Page, AVIATION; Operation Facts from the Air Mail Service, by J. C. Whitbeck, Air Mail Service, Post Office Dept.; Operation Lessons from the Ford Air Lines, by W. B. Stout, Stout Metal Airplane Co., Air Line Division, Ford Motor Co.; Reliability in Operation, by Lieut. J. Parker Van Zandt, Department of Commerce.

Still Afloat

Photo Underwood & Underwood

The PN9 No. 1 as she lay at anchor in Naniloah Harbor, Island of Kauai, after having ridden the high seas of the Pacific Ocean for nine days at the termination of the West Coast-Hawaiian Flight. Most of the fabric was intentionally stripped from the wings by the crew in their efforts to improvise suitable sailing rig for their boat.

The Shenandoah Investigation

THE revelations of the ordering of the Shenandoah on trips for the purpose of pleasing the crowds at State Fairs and against Commander Lansdowne's better judgment have justified the claims made in aviation circles that the real cause for the Shenandoah wreck was not to be placed on weakness of design or improper operation but on the orders issued by people who knew little about the capabilities of airships.

Commander Lansdowne's Protest

The key to the whole matter is contained in Commander Lansdowne's letter of protest.

On June 15 this letter was sent to Admiral Eberle by Commander Lansdowne:

"Referring to dispatches of June 10 and 11 the Shenandoah has been ordered to make a flight to Minneapolis and return including among other cities Kansas City. The length of this flight is approximately 3,000 mi. The beginning of the flight includes a mountain range requiring a minimum altitude of 3,500 ft. so that in leaving Lakehurst the ship should be only 83 per cent full without superheat. A flight toward the westward probably will be made against head winds. The temperature conditions prevailing in July are hot reducing gas to a minimum.

"The prevailing weather conditions in July in the upper Mississippi Valley include many cold severe thunder storms the type of weather the airship must avoid and this procedure requires additional fuel.

"Such an itinerary requires one or two landings and it is understood that Minneapolis has been selected as one landing point and Scott Field another. As the airship is required to leave Lakehurst without superheat these landings should be made without superheat or otherwise an indeterminate quantity of helium will be valved. It will probably be necessary under favorable conditions to valve a small amount, as engines four and five are not fitted with water recovery. Any delay therefore due to unfavorable weather requiring a landing during the heat of the day, is serious unless arrangements for gassing are provided.

"Should an occasion arise and such occasions are frequent that a heavy rain or severe thunder squall arrive at the landing field during furling operations the ship must take the air for safety and ride out the condition in the air. If it may be safely held on the ground a heavy rain will make it necessary to hold the ship continuously until sufficiently dried out to take on board additional weight in fuel.

"It is doubtful if the Minneapolis landing party is prepared to meet such situation. Assuming that arrangements have been made at the landing fields for promptly taking aboard fuel and water and that the weather conditions are favorable four days will be required to complete the flight. Derricks unfavorable and extremely adverse airship weather at this season in this area should be expected.

"To meet this situation adequate and proper airship facilities should be provided at landing points, including a mooring mast and a supply of helium. It is believed that it is the policy of the department to provide adequate and proper facilities for the safe operation of all types of naval craft, including rigid airships.

"It is pointed out should the department desire to make this flight without the facilities referred to, that such a course is reasonably safe later in the season after the thunder storm period has passed (September), provided freedom of action with respect to the exact date the flight is scheduled be permitted. It is, therefore, recommended that the Minneapolis flight be postponed."

This letter of Commander Lansdowne was forwarded by Captain Steele to the chief of naval operation with the following indorsement:

"Forwarded recommending approval.

"The experience of the Los Angeles on her attempted flight to Minneapolis on June 7 indicated that there is considerable hazard in a voyage of this season of the year."

The Rebuff

On June 20 Admiral Eberle sent the following communication to Captain Steele and through him to Commander Lansdowne:

"It is not the policy of the department to erect mooring stations at the various points selected for refueling on a cruise of this nature. If the limitations and apprehensions outlined in this letter and those in the first indorsement are sound it would appear that our airships are of little military or commercial value and that the great cost of their upkeep and repairs would not be warranted.

"However the chief of naval operations is not ready to concur in these opinions and believes that these ships can be operated safely with the exercise of care and judgment within the discretion of the commanding officer and within reasonable limits of time. Thunder storms and rains are likely to occur at any time along the proposed route between June 1 and Oct. 1. But there is a big percentage of favorable weather with few protracted storms.

The date of starting is left to the discretion of the commanding officer of the Shenandoah within reasonable limits of time.

"If difficulties are experienced it is always in the discretion of the commanding officer to alter the Shenandoah's course or to return to Lakehurst.

Despite this communication, stating that this trip was entirely feasible in July, the original letter of Commander Lansdowne was sent from the office of the Chief of Naval Operations on June 30 with the following indorsement, postponing the trip until September:

"The flight to Minneapolis and return via Scott Field, Ill., is deferred to the later part of August or the early part of September."

The next communication from Lonsdowne, in which he requests that the trip be postponed until the second week in September, is as follows:

"It is noted from reference (a) that the following fairs occur during the first week in September: Columbus, Ohio, Aug. 31 to Sept. 5; Des Moines, Aug. 28 to Sept. 4; Milwaukee, Aug. 30 to Sept. 5. And that the following fairs occur during the second week in September: Indianapolis Sept. 7 to 12; St. Paul, Sept. 5 to 12; Detroit Sept. 4 to 13.

"It is therefore impracticable to cover all points holding fairs during the week of each and the second week in September is recommended on account of the limited time for making preparations at Scott Field and Detroit."

One Week's Delay Refused

On Aug. 12 the following letter was sent from the Chief of Naval Operations to Commander Lansdowne, specifically stating that his recommendation that the flight he made in the second week in September had not been approved, and directing that the start be made on Sept. 2:

From chief of naval operations to commanding officer of the U.S.S. Shenandoah. (Aug. 12)

1—Orders have been issued (reference B), for the middle Western flight of the Shenandoah in accordance with the general plan submitted by you in your letter (reference B), to proceed from Lakehurst to Minneapolis by way of Scott Field and Des Moines and return by Detroit, with stops at Scott Field and Detroit.

2—Your recommendation to make the flight the second week in September has not been approved. By starting on Sept. 2, the Shenandoah would fly over the state fairs as follows:

Columbus Sept. 3, Des Moines, Sept. 4, Minneapolis Sept. 5, Milwaukee, Sept. 5, Detroit Sept. 6.

This includes all the state fairs except that of Indianapolis.

3—It is stated that a number of cities that have been included in previous itineraries are not included in the report submitted. The omission of these involving considerable detours has been approved, but where only slight detours are necessary the cities have been included in the itinerary prescribed (reference B). It is desired that this itinerary be followed as closely as possible though some of these cities may be passed over at night.

4—In view of the fact that the Shenandoah moored to mast at San Diego and Seattle on the Pacific Coast flight last year without previous trial, the necessity of making a trial flight in Detroit is not apparent. In view of the present schedule of the Shenandoah the department is reluctant to undertake the extra trip unless the commanding officer is convinced of its necessity.

Attempting Too Much

The last message in the file is apparently a message form of the Navy Department at Washington, containing a record of a message from Commander Lansdowne to Captain Lincoln. It evidently refers to some messages not in the file, probably telephone messages, and deals with a suggestion that the Shenandoah make Des Moines on the first leg of the trip. If the "first leg," as referred to by Commander Lansdowne means the first flight before making a landing, he was not required to make such a flight to Des Moines, the original orders, fixing Scott Field, Ill., as his landing place, not being changed. Commander Lansdowne apparently gained his point in this respect, not being required to fly to Des Moines in the "first leg." This message from Commander Lansdowne to Captain Lincoln follows:

Will attempt make Des Moines first leg but think it entirely impracticable as it involves 1,100 mi. flight to westward. Require leaving Lakehurst in evening to avoid losing gas over Alleghanies and must land at Scott Field before daylight. Therefore, to make Des Moines ship must average forty miles per hour ground speed to westward which had never been made good over this distance. Request Bay City be held in abeyance, depending on conditions Detroit. Urgently request no changes in approved schedule.

The letter of Admiral Moffett to Admiral Eberle follows in part:

While the bureau has great respect for the judgment of the commanding officer of the Shenandoah, yet on analysis of his letter shows it to be based largely upon worry over contingencies—running out of fuel due to weather, high temperature, thunder storms, and specially over the possibility of being unable to make a landing at Minneapolis with an untrained ground crew in order to refuel. If it believed that the command-

The Supermarine-Napier Monoplane

First Preliminary Details on One of the British Schneider Cup Entries

GREAT BRITAIN has formally entered two seaplanes in the race to be held at Baltimore for the Schneider International Seaplane Cup. On Sept. 26 the two machines, the Supermarine-Napier S4 and the Gloster-Napier III, left London in the steamer Minnewaska for America. The team, captained by Capt. C. B. Wilson, representing the Royal Aero Club of Great Britain, sailed at the same time.

As already stated in AVIATION, the Supermarine entry is a small monoplane of remarkably clean design, set upon twin floats and driven by a direct drive Napier engine of special type, modelled upon the well-known Lion, of 450 hp. After an inspection of the plane it can be said without hesitation that Great Britain is sending to America a machine which, at any rate, will bear comparison with the whole world.

Clean Lines

The photograph on this page will give a general idea of the clean lines of the machine, which is an entirely new type, and embodies a number of novel features in design and construction. The wing is one unit, built as a cantilever, and the skin is entirely made up of three-ply, the designer having wisely decided that in view of the high speeds required, fabric was not safe to use. As a matter of fact, there is not a fabric-covered surface in the machine, and entirely new methods of construction have been used in building the wing, while the tail unit, including both fin and tail plane, has been built integral with the fuselage. The wing section itself is a new one, recently developed at the Royal Aircraft Establishment,

The above photograph of the Supermarine monoplane entered in the Schneider Cup race is reproduced because of the great interest which undoubtedly exists in this entry, and it is the first photograph to reach this side and came by special mail to AVIATION

Farnborough, and tested there to the utmost limit. Flap gears are used to reduce the landing speed, which in a racing machine of such small area of surface is necessarily very high. The particularly clean design of the floats and undercarriage is a distinctive feature, and it will be noticed that beyond two cross-braces there is an entire absence of anything to increase head resistance. Flexibility is obtained by the use of high tensile steel members, concealed in the graceful lines of the fairing, and their ability to absorb shocks has been tested in at least one heavy landing.

Streamlining

The two points which have struck observers most, however, were the remarkably clean way in which the Napier Lion engine has been cowled in and the entire absence of external controls. Looking at the machine head on, it is difficult to see how head resistance could have been reduced by another fraction, while it is easy to see how the placing of all the controls inside the fuselage has materially assisted in lowering the total of parasitic resistance. Wing radiators are used, together with a metal propeller of the duralumin alloy type, and a special oil cooler of novel design has been incorporated.

There is no necessity to refer to the long record of successes achieved with the Napier Lion engine, but this particular unit has been specially developed from the extensive experience of the Napier company to such a point that the increased power and the reduced weight enable them to claim for it an advantage over many other aero engines.

Quick Construction Work

A neat attachment permits an external Bristol gas-starter to be used to start up the engine, and it was particularly noticeable how smoothly and evenly it ran and accelerated, imposing a minimum of vibration on the machine, even when on the ground. The designer of the machine is R. J. Mitchell, the chief engineer and designer of the Supermarine Aviation Works, who was also the designer of the Southampton military five-seater flying-boat, which has proved the finest flying-boat yet designed in England, and has been extensively ordered for the Service by the Air Ministry. Instructions to proceed with the Schneider Cup machine were only given on March 19, yet the first flight was carried out on Aug. 25, and, what is even more satisfactory, no modification of any major importance has been necessary from that moment.

The Personnel

The manner in which the authorities are cooperating in the matter is shown by the fact that the British Admiralty have detailed H.M.S. Valerian to be present at Baltimore during the race period to render all possible help on the water.

The pilots of the two British seaplanes, the other being a float type biplane entered by the Gloucestershire Aircraft Company, are Capt. H. C. Biard (Supermarine) and Hubert Broad (Gloster), with Bert Hinkler, who has been released by Messrs. A. V. Roe and Co., as reserve pilot. Mr. Mitchell is accompanying the team, together with Mr. Lind-Jackson, of Napiers, whose special care is the engine, while H. T. Vane, the managing director, and Col. M. O. Darby, of the Royal Aero Club, are coming out independently, together with Major J. S. Buchanan, head of the Design Section of the Department of Supply and Research at the Air Ministry.

Change in Personnel—International Air Meet

Two Martin Bomber airplanes have been taken out of the Detroit News Air Trophy Race because they are at least 10 m.p.h. slower than some of the other planes. This has been done in order that the flight of the other planes will not be delayed by the slower planes. This leaves eight of the ten planes of the Army that are going to compete in this race. The pilots of the two planes taken out are: Lieuts. Harry A. Johnson and C. L. Williams.

Shenandoah Investigation

(Continued from page 437)

ing officer of the Shenandoah merely desires to point out to the department these possible difficulties. In reference to the chief of naval operations' first indorsement hereon, commenting upon the limitations of airships, it is desired to point out that both the Los Angeles and the Shenandoah are operated under a handicap amounting to about 50 per cent of their cruising radius with hydrogen, due to the fact that these airships, while designed for the use of hydrogen are using helium. Were it possible to use hydrogen in the Minneapolis trip the operating technique called for would be a very simple matter."

Captain Steele, when on the witness stand, presented to the court messages from 383 individuals and organizations urging the Navy Department to send the Shenandoah to the middle West during the period of state fairs. He said this did not represent the total number of requests made to the department for such a trip. He said the Shenandoah was naturally anxious to appease this public demand for a sight of the airship.

Products of the Sikorsky Manufacturing Corporation

THE well-known, to the American public, Sikorsky S29A airplane, which made its first flight on Sept. 25, 1924, has since made 259 flights transported 2,514 passengers, and has covered 123,079 passenger miles, having been in the air 128 hr.

Among the more important flights were the following: To Washington on April 24, 1925, carrying two baby grand pianos and six passengers on board. The trip to Washington was made in 2 hr. 58 min., and the return trip in 2 hr. 38 min. On May 8, the S29 made a flight from Roosevelt Field to Yorktown, Va., with stop at Washington, D. C. The return trip was made from Langley Field without stop, in 3 hr. 7 min. On May 25 and 26, the ship flew to Albany, covering the races between the Gar Wood motor boats, and the 20th Century Limited. On Aug. 6, the S29 flew to Boston, returning Aug. 10 after a very interesting demonstration while in Boston. On Aug. 15, the ship flew to Bristol, Conn., and took part in an aeronautical meet held there by the Bristol Chamber of Commerce. Between Aug. 22 and 28, the S29 flew to Atlantic City, Baltimore, Washington and Hartford for the American Legion, broadcasting from a radio station installed in the plane, in behalf of the Endowment Fund Campaign of the Legion. During these flights, the S29 was often flown on one motor, never having a forced landing, and during this time no structural changes were needed.

Manufacturing Corporation Formed

The successful flights of the S29 have led to several orders to the Sikorsky Aero Engineering Corp. This necessitated forming a new corporation for manufacturing purposes, and the Sikorsky Manufacturing Corp., with a capitalization of $1,000,000 was formed, which took over the assets of the Sikorsky Aero Engineering Corp.

Among the orders placed with the corporation was an order from the Andian National Corp., a subsidiary of the Standard Oil Co., for one five-seater airplane, for extra heavy duty in the tropics, built around a Liberty 12 engine. This ship will be equipped with pontoons and will be used in Colombia, where are located the oil concessions of the Andian National Corp. Another order was received from the Fairchild Flying Corp., for one light single-motored plane equipped with the Wright Whirlwind J4 engine. This last plane was recently completed and shows very fine performances.

The Sikorsky Messenger

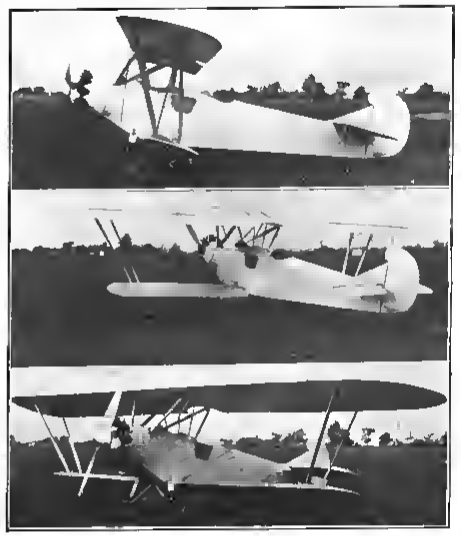
The Sikorsky Corporation has entered in the New York 1925 air races, a small one or two-seater plane called the Sikorsky messenger S33. This plane is constructed out of wood, but if desired can be built of metal. The general description is as follows:

Span upper wing	32 ft.
Area of planes	193 sq. ft.
Load per square foot	7 lb.
Load per horsepower	13 lb.
Weight empty	650 lb.
Useful load	500 lb.
Gross weight	1150 lb.
Speed	110 mi./hr.
Landing speed	40 mi./hr.
Ceiling	15000 ft.
Rate of climb	700 r.p.m.

This machine is of the biplane type and has a range of 300 mi. The power plant consists of one Lawrance L4, 60 hp. engine.

The Corporation has already built several sets of highly efficient wings for Curtiss Orioles and JN4, and the same wings are entirely suitable for the Standard planes. The performances of the JN4 with Sikorsky wings (same for Standard planes) are as follows:

With OX5 motor	
Total useful load	800 lb.
High speed	90/95 mi./hr.
Landing speed	40 mi./hr.
With Hispano Suiza 150 hp. motors, or the Curtiss C6:	
Total useful load	1000 lb.
High speed	105/85 mi./hr.
Landing speed	115/120 mi./hr.



Three views of the Sikorsky S31 built for the Fairchild Aviation Corp. and powered with a Wright 200 hp. air cooled engine

For Oriole planes the performances are increases in speed to about 5 mi., with the same increase in the landing speed.

Besides the mentioned planes, the Sikorsky corporation is building a new twin-engined plane, for ten passengers, equipped with two Wright J4 air-cooled motors.

Details of yet another plane, the S31, built for the Fairchild Aviation Corporation, are appended.

DESIGNED BY IGOR I. SIKORSKY AND BUILT BY THE SIKORSKY MANUFACTURING CORP. GENERAL DATA AND PERFORMANCES.

Upper wing span	42 ft.
Lower wing span	32 ft.
Total area of plane	388 sq. ft.
Overall length	28 ft.
Weight empty	1750 lb.
Normal useful load	1200 lb.
Load per square foot	8 lb.
Overload possible	1500 lb.
Load per horsepower 15 lb.	15 lb.
Power plant	
One 200 hp. motor (Wright J4 air-cooled engine preferred)	
Cruising speed	110 mi./hr.
High speed reached	120½ mi./hr.
Landing speed	35 mi./hr.
Ceiling. With one passenger	18,000 ft.
Ceiling. With normal useful load	14,000 ft.
Payload for cruise of 500 mi.	800 lb.
Gas tank capacity (for about 1000 mi.)	108 U.S. gal.
Safety factor all around	8½

1. The fuselage is exceptionally rigid built of square steel tubing assembled with bolts and rivets, no welding being used on structural parts.

2. The wings are of wood (optionally out of duralumin) covered with fabric

3. The fuel system of simple gravity type, with four separate gas tanks located in the upper wing. This greatly reduces the fire hazard

4 The landing gear, made of seamless steel tubing, is exceptionally soft, and of a divided axle or Vee type.

The S3I 1925 type is designed to be delivered in four different styles

1 Style "M" for mail and express, pilot in the rear. In the front, between motor and pilot, a cargo compartment of 60 cu. ft. for 800 lb. of mail or express.

2. Style "W," a war type for gunnery, observation or bombing purposes. The pilot in the front cockpit, gun-man or observer in the rear. Dual control provided.

3 Style "P," as a passenger taxi-plane with pilot in front and a comfortable four-passenger semi-closed cabin in the rear cockpit.

4. Style "PH," specially adopted for photographic work, with pilot in front, photographer's compartment in the rear, exceptionally roomy, capable of accommodating two photographers and two cameras if required. Exceptionally good visibility for this kind of work.

Meteorology and Aeronautics

In a paper read before the American Meteorological Society, Washington, D. C., on May 1, 1925, on the subject of "The Present Meteorological Needs of Aeronautics," Lieut. F. W. Reichelderfer, U.S.N., points out that the greatest need of the aviator today in regard to the cooperation of the meterologists is the dissemination of greater and more intimate information at more frequent intervals It is indicated that in general it is the violent and the highly localized phenomena that are the flier's greatest enemies, heavy rain storms and low clouds over large areas and even fog can sometimes be circumnavigated, but small violent storms can seldom be avoided.

The need for more frequent reports and reports from many stations is emphasized and the uselessness, in many cases, of forecasts covering a large area but only in general and issued at such infrequent intervals as 10 a. m. and 10 p. m., are obviously unsuitable for an aviator intending to commence a flight early in the morning and at a point remote from the meteorological station. Furthermore, the need for brevity in these general forecasts deprives the aviator of, to him, important details in regard to time, locality, intensity and duration of the local weather phenomena he is likely to encounter. The general vagueness of such terms as "overcast sky" which may on one occasion cover the condition of clouds being several thousand feet high and, on another, the presence of low lying cloud banks, is also remarked upon

Lieutenant Reichelderfer makes a strong plea for the investigation of visibility forecasts about which there is little knowledge at the present time, in spite of the urgent need for reliable information In this connection a case is cited of two pilots who set out individually to fly between two cities at the same time. One, a fast plane, climbed to a height of some 5000 ft. and continued on the journey although, when half way, thick mists were observed beneath, which completely obscured the ground The second plane flew at but half this altitude and, when half way toward the destination, met the same thick weather and, climbing a thousand feet, was unable to get above the mists and thereupon turned and went back. Had visibility forecasts been available such would not have been necessary for a continued climb of but a few hundred feet would obviously have overcome the difficulty. The selection of favorable flying levels in relation to the speed and direction of the wind will become increasingly important and the need is pointed out for extending aerological observations to include the obtaining of information on conditions pertaining above a cloud bank.

Shenandoah Pictures by Air

On Sept. 3, as soon as the news of the terrible accident to the Shenandoah became known, Curtiss Field at Garden City was a scene of intense activity as all of the large metropolitan dailies and film companies were immediately desirous of sending out ships to bring back the news pictures and films.

The first machine to leave the field was a special racing Oriole piloted by A. L. Caperton who was working for the Newspaper Enterprise Association of New York and Cleveland. This machine encountered a heavy thunder storm over New Jersey and was forced to land at Princeton for approximately one-half hour until the storm abated. As soon as it was possible the machine went on, stopping at Harrisburg for gas and then proceeding to Moundsville where the pictures were supposed to be waiting. This machine was ready to return to New York at 2 p. m. but, through some unfortunate misunderstanding and confusion at the scene of the wreck, these pictures were not delivered until 7 p. m. which was too late for the return trip and which caused Newspaper Enterprise Association to loose a wonderful scoop, as they were the first ones to have photographers on the ground and the machine could have arrived in New York before dark provided these pictures had been delivered on schedule However, Caperton left Moundsville as soon as the fog lifted the following morning and arrived in New York at 1 p. m., daylight saving time.

The second machine to leave was piloted by William McMullen, working for the Pacific and Atlantic Photos representing the Daily News of New York and the Chicago Tribune of Chicago. This machine flew directly to Harrisburg where McMullen received telephone instructions to proceed to Pittsburg where pictures would be awaiting him. Again, the delivery of pictures was delayed through no fault of the airplane and the pictures were not delivered to McMullan until midnight that day. Leaving Pittsburg early in the morning, the pictures were delivered in New York at 2 p. m. on Friday.

The third plane was piloted by J. P. Andrews and carried with it a photographer and reporter from the New York American. This machine left around noon and after stopping at Harrisburg succeeded in reaching Alva and landing within a mile of the scene of the wreck. Instead of attempting to hurry back in the morning it was decided to fly around and get aerial pictures of the wreck and the machine returned to Garden City before dark on Friday.

The fourth machine, piloted by E. P. Lott and carrying representatives from the New York Herald Tribune, reached Moundsville before dark. The newspaper men proceeded to Caldwell where they obtained their story and pictures. The machine left in the morning and arrived in Garden City about 5 p. m.

The fifth machine piloted by C. S. Jones carried representatives from the New York World. This machine did not get away until 3 p. m. and, because of darkness, was forced down on the side of a hill in Pittsburg at 5:30 p. m. The reporters proceeded to Pittsburg where they were able to get pictures and story and returned with these the following day by air to New York.

The above story is written in detail to show what reliable service can be rendered by operating companies upon very short notice and to what extent the newspapers are depending upon the airplane for quick service. Five machines covered over two thousand miles in less than two days without accident or delay and the reason the pictures by air did not get a big scoop was due to the failure of delivery of the pictures from the wreck and not to any fault or delay of the service In addition to the above flights, the Curtiss Exhibition Company were forced to refuse and refer to other sources, several other inquiries from the New York dailies, as they had no more pilots available for undertaking the work Other operating companies throughout the country report the same demand for planes to cover this same story and without question thirty or forty commercial airplanes were used for this purpose.

The Fokker FVIIA Passenger Transport

The Latest Example of the F Series of Single Engine Passenger Monoplanes to Be Built by Fokker

The name of Fokker has been closely associated with commercial air transport in Europe ever since the close of the war. He has produced a succession of single-engined passenger monoplanes known as the F series. These machines have all been more or less similar, the principal differences being a gradual increase in size. The series is not quite complete. The first machine to appear was the F2 and several of this type were imported to this country and very successfully used The next machine was the F3, which was very little different from its predecessor.

The next type, the F4, became very well known in this country as it was the machine used by Macready and Kelly in their duration and non-stop transcontinental flights As used by the Air Service it was known as the T4. It was a larger machine than the previous types and was fitted with engines of about 400 hp. The F5 was the only one of the series that incorporated the biplane idea at all, being arranged to use a lower wing if a very large useful load was required and a reduction in high speed was acceptable. The F6 was convertible to a military machine and has not been extensively used.

The Most Recent Design

The latest product in this series is the F7. This machine, like its predecessors is designed to be fitted with various engines and has already appeared with the Rolls-Royce Eagle XI, the Napier Lion and the Liberty. One of the first public appearances of this model was the fine flight made by Van Der Heop from Holland to Batavia This is also the type that was flown by Mr. Fokker himself in the recent non-stalling demonstration at Croydon, described in the May 25 issue of AVIATION.

The wing, which is tapered in plan form, with elliptical wing tips, is built entirely of wood and covered with three-ply veneer. The section tapers from the center toward the tips and is flat on the undersurface though highly cambered on the upper surface, with a rounded leading edge. As is customary in Fokker practice, the wing is a cantilever structure the section at the center being very thick.

The fuselage is of the familiar Fokker welded steel tubing and piano wire construction. Accommodation is provided for eight passengers and two pilots, though ten passengers can be carried without difficulty As in most modern passenger transport machines there is a lavatory and baggage compartment behind the passenger cabin. A door in the front wall of the passenger compartment gives access to the pilot's cockpit. The windows may be opened or shut and provision is made for warming the cabin. There is ample room in the pilot's cockpit for radio and night landing equipment

Ample Baggage Space

Baggage is carried in separate holds at the rear of the cabin to which access is gained by a door on the opposite side to passengers' entrance, the entry of passengers is therefore not interefered with by loading baggage which can be carried on simultaneously, and there is also no baggage nor freight in the cabin. There is a second baggage or mail compartment below the pilot's cockpit. The total amount of cabin and baggage space provided is 493 cu. ft.

The cockpit for the two pilots is situated immediately behind the engine, the floor being on a level with the center line of the engine, which provides an extremely good view forward. Extensive safety glass windscreens are provided, which make the cockpit extremely comfortable to fly in Complete dual non-magnetic controls are fitted The cockpit is separated from the engine compartment by a fire wall and is heated with clean warm air.

Undercarriage Extremely Simple

The undercarriage represents quite a departure from that in previous members of the series It is, in general, a standard steel tube split axle type of Vee with the rear members vertical. Its great feature is in the method of taking the landing shocks, which are entirely transmitted to the main spar of the cantilever wing. This is accomplished through the agency of a vertical steel tube member carrying the rubber ring shock absorbers and extending vertically direct to the wing spar and is joined to it several feet out from the fuselage.

The tail areas are comparatively small but this can largely

One half front view of the Fokker FVIIA Liberty engined passenger transport monoplane

be accounted for by the length of the fuselage. Both rudder and elevators are balanced and all control surfaces including the ailerons are constructed of steel tube and are fabric covered. Control cables to the tail surfaces run outside the fuselage.

The engine mounting is detachable by means of 4 bolts and the nose is so designed that engine mountings for different makes and types of engine can be easily fitted. Up to the present, the Rolls Royce Eagle IX 360 hp., the Napier Lion 450 hp, the Liberty 400 hp, the Lorraine Dietrich 450 hp and the Bristol Jupiter 450 hp. (air cooled radial) engines have been fitted and performance tests carried out with each engine. Either the engine itself or the entire installation together with the engine mounting can be changed over quickly.

Starting the engine is accomplished, in the case of the Napier Lion and the Rolls Royce, with a starting handle and electric ignition device, and in the case of the Liberty, either with a starting handle operated from inside the airplane or with an electric starter, in which case the latest type 12 volt ignition is installed.

When the Liberty engine is used a circular nose radiator with complete metal shuttering is fitted. The entire power plant installation is completely accessible on all sides by removing the cowling, which is fitted with quick detachable safety pin fastenings. Doors are provided for access to all magnetos, pumps, etc.

The fuel tanks are carried in the wing and the feed to the carburetors is by gravity only. The tanks are protected by their location between the spars of the wing and the gravity feed eliminates all multiplicity of pipe lines, pressure pumps and similar complications. Large and accessible strainers and drain plugs are fitted.

The controls are light in operation and very effective at all speeds, even below stalling speed it is claimed. The natural stability of the airplane and the lightness of controls greatly relieve the pilots from fatigue in long flights and bad weather.

The general dimensions of the FVIIA and performance are given in the attached specification. It will be noted that in spite of the very large load carrying capacity and the relatively low horsepower used, a sufficiently high cruising speed for all commercial purposes is maintained. The take-off is quick and easy; great safety in forced landings is provided by the low landing speed and the flying qualities above described.

Span		92 ft 8 in
Length		61 ft. 10 in
Height		12 ft. 7 in
Wing area including ailerons		945 sq. ft.
Track of landing gear		13 ft. 8 in
Liberty 400 hp Standard United States Army Type		
Weight empty (equipped)	2350 lb.	
Crew (pilot and mechanic)	2100 lb	3850 lb
Passengers and baggage	950 lb	3430 lb
Fuel and oil		
Useful load		7280 lb.
Wing loading		11.3 lb /sq. ft.
Power loading		18.2 lb /hp.
Duration at cruising speed		about 6 hr.
Time to climb 1000 m. (3280 ft.)		9 min.
Time to climb 2000 m. (6560 ft.)		20 min.
Time to climb 3000 m. (10,000 ft.)		47 min.
Service ceiling		11,000 ft.
Top speed		125 mi /hr.
Cruising speed		98 mi /hr.
Landing speed		43 mi /hr.

Note: The above performances are the results of actual tests with a full useful load of 9450 lb. and corrected to standard atmosphere and temperature.

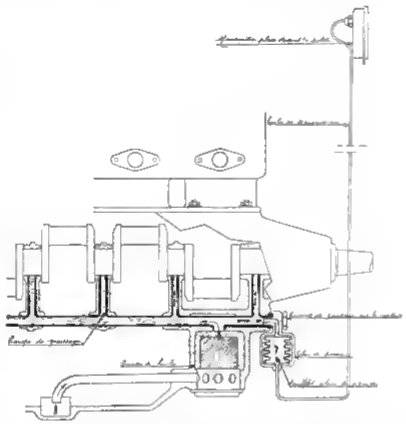
Japan Seeks Air Subsidy

At the session of the Diet next December the Kato Government has decided to present a proposal for a five-year subsidy of an aerial transportation system between Japan and China. It is estimated that about $10,000,000 will be required.

The plans call for routes between Osaka and Shanghai and between Tokio and Dairen, the former to be completed in 1926 and the later in 1930. There are to be six round trips a week between Tokio and Dairen and three round trips weekly on the other route. More than fifty planes will be required.

New French Oil Pressure Gage

The oil pressure in the lubrication system of aviation engines is usually indicated by a pressure gage placed on the instrument board which is directly connected with the oil. In case of rupture of the line from the engine to the gage, the oil will rapidly be pumped out of the system. In the case of multi engined machines, and in some flying boats, these gages are frequently a considerable distance from the engine. In cold weather these long lines sometimes cause the gage to give an incorrect indication, due to the thickening of the oil in these long pipes.

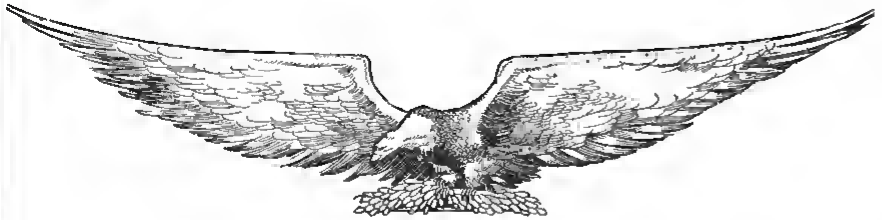


The French firm Precision Moderne have produced a new type of oil pressure gage based on the designs of M. Amyot. This gage is designed to be placed before the pilot or mechanic, regardless of the location of the engine. The device consists of a cup which is attached to the engine in such a position that it is filled with lubricating oil under pressure. This cup is made of duralumin, and is strong enough to stand accidental blows. A sylphon nearly fills this cup and covers an opening which leads to the pressure gage. The sylphon, the transmission line and the pressure gage are filled with an anti-cooling fluid which will not congeal at any temperature likely to be met in service. The function of the sylphon is merely to separate the oil and the indicating fluid in case of rupture of the transmission tube. In that event, the pressure of the oil forces the sylphon down over the opening to the transmission tube, and no oil can escape. The transmission tube is protected by a steel ribbon wrapped around it. The small diameter of this tube renders it extremely flexible, and it may be carried around any corners that may be necessary without danger of breaking. The pressure gage is an ordinary Bourdon gage.

A New German Airship Patent

It is understood that Dr. Hugo Eckner, who was in charge of the airship Los Angeles during the Friedrichshaven-Lakehurst flight has filed a patent in the German Patent Office for a combination gas cell for rigid airships, using both hydrogen and helium gas.

Dr. Eckner's plans divide each gas cell horizontally into two sections, with the lower part of the cell having one-third the capacity of the upper. The lower part would contain hydrogen, while the upper would be filled with helium. For rising from the ground both sections would be inflated, and when the ship rose to a height of 2,000 ft. the hydrogen could be blown off, and safety, which is the object of using the expensive helium gas, would be accomplished.



The Airship

RISING again and again above disappointments and failures which would have crushed ordinary men, those two indomitable spirits of progress, Wilbur Wright and Orville Wright flew the first successful heavier-than air machine at Kitty Hawk, North Carolina, twenty one years ago

OBSTACLE with them was spelled—
O-P-P-O-R-T-U-N-I-T-Y

THEIR spirit was truly American, unconquered and unconquerable The Shenandoah disaster will not stop progress in lighter-than air It will encourage progress It is not the American way to give up in the face of defeat

FOR those who hesitate, let them be reminded that it is a high honor to participate in man's last and final accomplishment in the development of a rapid, convenient mode of transportation, which eventually will give each individual in ANY part of the world, a common, economic interest in EVERY other part of the world.

THE AIRSHIP is not alone an instrument of war—more important, it is a MESSENGER OF PEACE

* * * *

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AIRPORTS AND AIRWAYS

Detroit, Mich.

By Virgil Simmons

Now that practically all of the itinerant fliers have become fixed base operators, which, from personal experience, I can say was a very fortunate development in that phase of commercial aviation, the group now preparing to hop off from Northwood Field can rightfully be termed "The last of the Barnstormers." Two OXX6 Standards, 3-place, and a New Swallow, comprising the group, will be flown by Ted Home, John Miller and "Pat" Gallup. Gallup is now in Wichita taking delivery of the New Swallow for A. R. Taylor, the owner.

It is hoped that a good measure of success will be theirs as they "play the Fairs," for indeed they spread the gospel of flying. I have been fortunate in being able to secure the new Travel Air from George Millens and the ship is now at Eastwood Field, assuming its share in completing advertising contracts and making taxi trips.

We operators of private commercial fields are in close touch with the variation of public feeling toward flying, at any rate, as the impromptu air passenger percentage has been decreasing, in the last month, due to adverse publicity, etc., the call for student instruction and various forms of aerial advertising, has more than compensated for it.

The Detroit Flying Club has the assurance that the 160 acre tract of land on the Straits of Mackinaw will be deeded to it provided the Club shows proper appreciation by creating an airport out of the property.

Further good work is being done by the inspection committee of the Detroit Flying Club, by placing airworthy certificates in the passenger seat and a certified pilot insignia on the fuselage of all planes operating commercially, that are in good safe condition, operated by capable personnel.

It should encourage the prospective air traveler to take a pleasure flight or use the modern safe airplanes, so designated, and now available, for fast inter-city transportation.

Aerial Survey and the Temple Bill

Aerial survey, based on extensive projects carried out in the past year, is estimated by the U. S. Geological Survey to create a saving of from 35 per cent to 75 per cent in the cost of making and revising maps as compared with the cost by ground survey alone, and cuts the time required more than 50 per cent. The decision of the Topographic Branch, U. S. Geological Survey, to give preference to aerial photographic mapping so far as possible in carrying out the provisions of the Temple Bill program for mapping the entire area of the United States within 20 years, is the most noteworthy evidence that aerial survey has passed from the experimental stage.

In conference with the Director of the U. S. Geological Survey on the subject of the Temple Bill program, it was stated that the Survey will map or re-survey practically the entire area of the United States. Less than one-half of the 3,000,000 sq. mi. contained in the continental limits are mapped, and existing maps of practically all of the balance of the area need revision. In order to exercise the fullest economy in cost and time, the Survey will need aerial photographs of approximately 2,000,000 sq. mi. of this territory.

The fifteen photographic sections in the United States, if maintained to full strength, will be able to fulfill the laboratory operations necessary to keep abreast of the annual requirements of the Geological Survey and priority projects for the War Department, in addition to their routine duties.

The situation as regards necessary airplane reserve is not so favorable, as the special remodeled DH photographic ships at present under production will about supply replacement for the planes now assigned to sections and which are, in most cases, near the limit of their service. After these ships are worn out, reliance only can be placed in such numbers of the Davis-Douglas observation type as appropriations may make available.

Denver, Colo.

By J. A. McInaney

"'Tis a privilege to live in Colorado"—that's the slogan of the state, but when you see some of these birds land here you'd think it a miracle that they still "live in Colorado." Our Chief, J. Don Alexander is using a cane and one crutch, another member a wheel chair. Both of these men have learned to fly, one of them went through the war without a scratch, and yet—the Chief is laid up with lumbago caused by playing with Nod, his St. Bernard dog, and the other gentleman ran into a hornet's nest while on a vacation. And they say that flying is dangerous.

We've been holding classes in aeronautics for all those interested. "Aint we got fun" listening to some of the questions and answers. Example—Instructor to Kadet—"What makes an airplane fly?" Kadet—"The Pilot." Instructor—"No, no, why doesn't the plane fall?" Kadet—"I thought they all did, eventually."

Instructor—"Why is a monoplane more efficient than a biplane?" Kadet—"Because you have just half as many wings to repair." Instructor—"Why is the fuselage built so that it tapers toward the tail?" Kadet—"To make it light enough for one man to lift and turn."

Lisbon Airport

The flight of Captain Weiss of the French Air Service to Lisbon last month is said to have been for the purpose of studying local conditions with the idea of utilizing that city as an intermediate base for the France-South Africa and France-South America air services, according to consular advices to the Dept. of Commerce. The South Africa service extending as far south as Dakar is already in operation for mail and has resulted in cutting the mail time from South America to France, the connection with South America being made by means of mail steamers to Brazil.

Aside from the possibility of developing additional business through a route via Lisbon an air base located there would permit an alternate route to that now in operation through Spain.

Monmouth, Ill.

Construction within the next few months of a lighted airway between Monmouth and Maywood, on which experimental lighting devices can be given service tests, is expected by officials of the Development Division, Air Mail Service.

Several firms are now engaged in the improvement of lighting equipment for installation on the transcontinental airway, and it is expected that this material will be tested by the Development Division before it is purchased in quantity for the service.

Among the lighting equipment that has been received at the Monmouth field during the last few days is a shipment of ten routing beacons built by the American Gas Accumulator company. The lights are operated by acetylene, which is contained in a double tank large enough to furnish gas for the light for a period of six months.

Similar beacons, also furnished by the A. G. A. company, are already used on the night airway between Chicago and Cheyenne and are located approximately three miles apart. They are, however, only about half the size of the new lights received for testing here. The gas light has an automatic control valve operated by the sun, which automatically shuts off the light during the day. At night or even when the sun is covered by a cloud the light will begin flashing again, at the rate of about sixty flashes per second.

It is estimated that the new gas beacons can be seen on a clear night for a distance of nearly ten miles. As they are entirely automatic in operation, it is only necessary for an attendant to visit the light twice a year and replenish the gas tanks.

One of the lights has been set up on the field and is now

operating each evening.

Two new electric beacons have also been received at the field for testing. One of these is of a type developed by the General Electric company for use on the lighted airway between Cleveland and New York across the Alleghany mountains. It was found that the ordinary beacons were not very successful in these rough hills and the new G E revolving beacon was designed.

It consists of a set of four Ford headlights, operated by 110 volt current, which are set around a central post and revolved by a large motor in the base of the beacon. One of the lights is set a half a degree above the horizon and the others slightly higher, so that the beam can be seen from almost any position above or below the light. The lights burn all the time but the beacon apparently flashes four times every revolution. There is also a new beacon developed for operation by electricity by the A. G. A. company, makers of the gas routing beacons.

Part of the lighting equipment received includes ten steel towers, twenty feet in height, on which some of the beacons will be erected. There is no especial hurry for the lighted airway and it is probable that tests on some of the new mail planes will be completed before work is started on the installation of the lights between Monmouth and Chicago.

St. Joseph, Mo.

By Cy Caldwell

I've just paid a visit to St. Joseph and its suburb, Kansas City. St. Joe is a fine city, and K.C. is a nice little place too. But the heat was awful. 105, I believe. There was a wedding party in the hotel the night I was there. And as the bride and groom left for their train, the orchestra played "God help the sailors on a night like this."

I was disappointed not to find any Indians at the station, but a porter told me there were usually several Indians hanging around the Chamber of Commerce, so I went up there and found Carl Wolfley. It was so hot he wasn't wearing his blanket.

Carl took me for a ride around St. Joe, during which we ran out of gas. We'd been out of gas for half an hour before we discovered it. In fact, we wouldn't have found it out then, only Carl stopped telling me about St. Joe for a minute, and of course the motor stopped dead.

Carl showed me the new Municipal Airport, a field that would do credit to any city. Very conveniently located right on the west corner of the city. To get to town all you have to do is climb a small mountain and roll down into the back entrance of the Rohidoux Hotel. Or you get a log and float down the Missouri River to the Municipal wharf. It's right handy, either way.

St. Joe is an amazing city. The local chapter N.A.A. has 2200 members—every man in town except the Chinese laundryman and two Scotchmen. They expect to enroll the Chink in their next drive. As we drove back to town we passed a road sign, "City limits. Rednee speed to 45 miles an hour." That shows what a fast town St. Joe is. We went to lunch with a very fine Indian named Wagner, who works for the Standard Oil in St. Joe. He took me for a ride in his Packard after lunch, so I presume they must have struck oil on his reservation. He wasn't wearing his blanket either.

I want to say that nowhere in the world are pilots more welcome or are better treated than in St. Joe. The hospitality of these kindly people, these unspoiled children of nature, is unbounded. There the hungry pilot from the East may eat free and see free shows. I produced my pilot's license and was admitted free to the Orpheum. And that's the first time my license was ever of any use to me. But it was so hot I came right out again. Now, there was 30 cents' worth of free amusement I didn't get. And when I leave 30 cents' worth of anything you can be sure there was reason for my doing so.

St. Joe will undoubtedly become one of the great centers of air travel in the United States. Free meals and entertainment to pilots will insure this. Also St. Joe has erected one of the finest and most beautiful funeral homes in the country. People are just dying to enter it.

Well, when I got back to Cleveland I found I shouldn't have gone West at all, leaving Glenn L. Martin to his own devices. No sooner was my back turned than he went to New York and met Miss Fay Lanphier (Miss America) and party. They went to Earl Carroll's "Vanities" where the comedian, Julius Tannen, spotted them and hauled Miss America and Glenn L. onto the stage, where he introduced them to the audience. Both were applauded and had to give a speech. The audience listened to my boss and looked at Miss America and were highly pleased. Mr. Martin said in his speech that he was glad the President had authorized an investigation of the aircraft situation and that he felt much good would come of it. Well, the comedian had been telling jokes all evening, so this one went over all right and got a big laugh.

Shall We Do It;

We are a happy little bunch of aviators down here and we are going in two bodies (both of us) to the Races in October.

Do you think the management of the aforesaid excitement could be prevailed upon to give us an added attraction—a "feature de luxe" as it were?

Can we have Cy Caldwell put in a glass case in the middle of a corral with Porter Adams prowling around loose so that all who come, from near and far, may see these two supermen?

Thanking you kindly one and all,

The Jacksonville Aviators.

St. Louis, Mo.

By George T. Rutledge

Lambert-St. Louis Field is one of the most active commercial fields in the country. Very seldom a day passes that many hours of flying are not put in, either instructors and their many students of the Robertson Aircraft Corporation, passenger carrying, stunt flying and sometimes photography work. Visiting planes drop in quite often from all parts of the surrounding country. All pilots are invited to the field. Gas, oil and spare parts, anything from an OX rockerarm to a Standard tail skid, may be obtained from the Robertson Corp.

Some of the civilian fliers that own planes on the field are Frank Dunn, Hisso Standard; Clem Henry, OXX6 Standard; John Kabota, OXX6 Standard; Sam Matlock, OXX6 Special (Oriole wings, Canuck fuselage, Jenny tail surfaces and etc); Byron Mulherg, OX5 Standard, and Field Manager O. E. Scott, Travel Air and OX5 Standard. Other excellent fliers on the field are the well known Clevenger, Bud Gurney, Ben Lichty, Bob Mimick and Dan Robertson.

John Kabota is a young Japanese fellow, who learned to fly at the Robertson school where he also purchased his ship. John soloed in a remarkably quick time and has turned out to be a very good pilot.

Bud Gurney recently test-jumped a new 28 ft. parachute that he made. It came up to his full expectations.

Ben Lichty has just returned to the field after flying a special Standard to Detroit. Ben warns all fliers to avoid Chesterson, Ind. While stopping there he left the field and on returning discovered that someone had been flying his ship and had damaged it!!

Dan Robertson just arrived after delivering an OXX6 Standard in New York State. He is still working on his Canuck, which, when finished (sometime before Christmas, maybe) will be the most beautiful Canuck that has ever taken the air.

Ben Lichty still loves Mabel.

Gary, Ind.

Capt. J. A. Yonge of the Gary Flying School was the guest of honor at a meeting of the Gary Rotary Club and delivered an interesting talk on aviation with particular emphasis on the safety of flying in well kept up, present day airplanes. Captain Yonge has recently acquired a new Standard with an OX5 engine. During the first seven weeks of operation, his first ship made 237 passenger flights, 169 student instruction flights and 743 landings. The total time for the period was 91 hr. 21 min.

United States Air Forces

U. S. ARMY AIR SERVICE

Lowell Smith to Duty

Capt Lowell H Smith recently returned to the Rockwell Air Intermediate Depot, Coronado, Calif., and resumed his old duties as chief engineer officer and chief inspector, also officer in charge of parachutes.

Captain Smith has been on detached duty and leave since the starting of the Round the World Flight and, according to the *Air Service News Letter* correspondent, his return to duty at the Rockwell Depot was no doubt due to his personal desire to get back to the land of sunshine and flowers for which the Golden State of California is noted.

Lieut Leslie P Arnold, who accompanied Captain Smith on the World Flight, also reported at the Rockwell Air Intermediate Depot and has been assigned to duty as assistant engineer officer and operations officer.

Flying Pay Situation

No legislation looking to the abolishment of flying pay will be initiated in the War Department, according to Assistant Secretary of War Davis. He said the subject of pay for aviators had been discussed from a number of points of view, largely in an informal manner, in the department, but there is no question now before the War Department for the abolishment of flying pay. It had been suggested that part of the flying pay for officers be converted into insurance for officers' dependents or that the entire flying pay be converted into insurance.

The subject of new flying pay, it is expected will come up in Congress at the next session.

Expansion of Air Service Photographic Work

Both the military and civilian work of the Photographic Sections of the Air Services have shown a considerable increase during the fiscal year of 1925.

Instruction in the utilization and exploitation of aerial photographs for military purposes is now a permanent part of the courses at the General Service Schools, Fort Leavenworth, the Infantry School, Ft. Benning, Engineer School, Fort Humphreys, and various other service schools.

The feasibility of making accurate military maps by aerial survey of areas of which there were none or inadequate maps, was convincingly demonstrated in several instances during the fiscal year.

In the Second Division maneuvers, held at Fort Sam Houston in April, 1925, fire control maps were made from aerial photographs, the control for which was projected from base lines established within friendly areas. This map was prepared under the following assumptions:

a. That the area in front of the line was inaccessible, necessitating that all control be taken from in rear of that line.

b. That a map having an accuracy comparable with the accuracy of the Field Artillery firing map would be satisfactory.

c. That the time in which to make the map was limited.

Photographs were made by the 24th Photo Section over the simulated enemy areas and the resulting maps were ready for distribution within eighteen hours after the photographs were made. General Malone stated that the actual firing by the artillery proved the map was satisfactory in every way, being accurate within two miles of deflection and to one probable error in range. Road reconnaissance mosaics were also prepared for practice marches of the Second Division.

Experiments were carried on in the last eight months by the Air Service personnel at Fort Bragg with the Field Artillery Board, in the use of aerial photographs for fire control. It is found that aerial photographs are as accurate as existing maps in obtaining range and deflection. Report in detail of these experiments is now being compiled by the Field Artillery Board.

During this fiscal year approximately 15,000 sq. mi. were photographed for the War Dept. and federal bureaus for map making purposes alone.

In addition to the cooperation with other branches, photographic mosaic maps of many tactical and strategic areas of the United States for the Corps of Engineers and extensive projects for the Board of Rivers and Harbors have been completed. By far the greatest demand for aerial photographs during the fiscal year, however, emanated from federal agencies outside the War Department, practically every federal bureau being represented in these requests.

Crop Forecasts by Plane

One of the most difficult problems of the Department of Agriculture has been the prediction of the current years crops of the various staple foods.

Former methods have involved interviewing farmers as to the amount of their land planted in wheat, corn, oats, truck gardening produce, etc., or driving about the country actually measuring off the fields. Either system of taking this census has been slow, burdensome and expensive. The new idea is to take pictures from the air and make measurements from a set scale.

As an experiment in finding the most practical height for taking these pictures, exposures were made at altitudes of 2,000, 3,000, 4,000, 5,000 and 6,000 ft. The advantage of the high altitude is the amount of acreage possible in one photograph, but the exposure must not be so high that the identification characteristics of the different crops is lost.

On July 22, Mr. Lockwood, test pilot at McCook Field, piloted Lieutenant Plank in the photgraphic plane (DH4BP) to take the first experimental photographs. Lieutenant Hutchinson with C. J. West, the Ohio representative of the Department of Agriculture, and Mr. Lloyd, the editor of the *Ohio Farmer*, accompanying the photographic plane, on the Honeymoon Express (DH4B) airplane. The weather being favorable, excellent pictures were obtained and turned over to the Department of Agriculture for further action.

Should this airplane-photographic method of crop census taking be adopted, the saving in time and expense would be almost incalculable, and the issuing of crop predictions could be accomplished at a much earlier date. If it is successful, it is only logical to suppose that it would become national in scope—and another set custom will have given way to the revolutionizing qualities of the airplane.

Planes Help Lieut. Brookley Get Married

Shortly before Lieut. W. H. Brookley was relieved from duty at McCook Field he was joined in the holy bonds of matrimony, the ceremony taking place at a certain town a short distance from Dayton. On the day of the wedding the McCook Field pilots, bent on mischief, gathered together a motley collection of airplanes, among them being the Honeymoon Express, a Huff Deland, a Curtiss Pursuit ship, an SE5, a Vought, etc. This expedition was equipped with fifteen small parachutes, each one bearing a tag inviting the finder to call on Lieutenant Brookley at a specified address and receive the sum of one dollar. Some time before the ceremony the planes were flown to the town, and, when the pilots reached a safe altitude above the public square, they began performing various acrobatics, calculated to bring the whole populace out on the streets. At this juncture the little chutes were released, it being thought that there was small chance of their going astray under these conditions. After this nefarious bit of work, the pilots circled over the place where the wedding ceremony was held, released some 97 pounds of rice, and followed this up with a heavy bombardment of all the old shoes it was possible for the pilots to gather up.

When the pilots returned to McCook Field they found waiting for them a very lengthy telegram from Lieutenant Brookley, marked "Collect," and reading partly as follows:

"Whole town in uproar. Have already paid for fourteen chutes. Worth every damn cent. This telegram will help equalize the cost of one chute ....."

The unaccounted fifteenth chute was later found tangled up on the tail skid of one of the airplanes.

Army Air Orders

Following officers A. S. Res. to active duty from places indicated, reverting to inactive status March 31: 1st Lieut. Leslie Granger Mulzer, Tiffin, 2nd Lieut. Leslie Ralph Tower.

1st Lieuts. A. S. Oliver Wendell Broberg and Robert Kauch promoted to rank of captain. Sec. Lieut. Lawrence Joseph Carr, A.S., promoted to rank first lieutenant.

Sec. Lieut. John S. Griffith, A.S., Kelly Field, to San Francisco, sailing on transport for Hawaiian Dept. Oct. 14.

Sec. Lieut. Reuben Kyle, jr., A.S. Res., Columbus, Ga., to active duty Brooks Field, reverting to inactive status March 18.

Sec. Lieut. Chester Newton Byles, A.S. Res., Melbourne, Wash., to active duty Brooks Field, reverting to inactive status March 18.

Following officers A. S. from places indicated to Chanute Field: First Lieuts. Rudolph W. Propst, Mitchel Field, Bushrod Hoppin, Harrisburg, Sec. Lieut. Don W. Mayhue, Pope Field. Lieutenant Hoppin's name is removed from detached officers' list.

First Lieut. Harold F. Rouse, A.S., Langley Field, to Wilbur Wright Field.

First Lieut. Hugh W. Downey, A.S., relieved as student A. S. Eng. Sch., and to report to C. O., McCook Field.

Maj. Barton K. Yount to Paris, for duty as assistant military attache.

Sec. Lieut. Everett S. Emerson, Corps Eng. and Sec. Lieut. Richard H. Dean, Signal Corps, to Brooks Field for flying training.

Sec. Lieut. Donald F. Stace promoted to rank of first lieutenant.

Sec. Lieut. Robert C. Ashley resigned.

Following officers to active duty: First Lieuts. James H. Kindelherger to Langley Field, Va., reverting to inactive status Sept. 6; Walter F. Reagan, to Fairfield Air Int. Dep., reverting to inactive status Aug. 17; Earle R. Strong, to Middletown A. Int. Dep., reverting to inactive status Aug. 17.

Following officers, A.S., to active duty:

Lieut. Col. John A. Hambleton and Capt. Harold E. Weeks to Langley Field, Aug. 3 to 17.

Capts. Louis Stokes Connelly, Robert E. L. Murphy, 1st Lieuts. Merlin F. Crutcher, Clayton C. Shangraw, 2nd Lieuts. Gerald Dack, Henry I. Jenks, Frederic C. Parsons, Clarence W. Welch to Office, Chief of Air Service, Washington, D. C., Aug. 3 to 17.

First Lieut. Elliott W. Springs to Selfridge Field, Aug. 16 to 30.

Capt. Samuel H. Anderson to Rockwell Field, Aug. 29 to Sept. 12.

Capt. John R. Irwin to Rockwell Field, Aug. 30 to Sept. 13.

Majors George M. Brett, Clifford B. Griswold, Capts. Darlington Cope, W. M. Reading, James R. Walsh, 2nd Lieut. Ronald M. Hazen to McCook Field, Ohio, Aug. 30 to Sept. 13.

First Lieut. Francis T. Murphy and 2nd Lieuts. Arelus D. Hunter to Kelly Field, Tex., Aug. 30 to Sept. 13.

Capt. Robert E. Ellis, 1st Lieut. Charles I. Preston, 2nd Lieuts. Paul Baner, Donovan R. Berlin, Joseph A. Bishop, Vern C. Davison, Jesse E. Eshbaugh, Fred W. Heckert, Wofford E. Lewis and Lester W. Trees to Kelly Field, Aug. 30 to Sept. 13.

Capt. Leo J. Griffin and 1st Lieut. George V. Straker to Mitchel Field, N. Y., Aug. 30 to Sept. 13.

To Wire Aerial Pictures

Nationwide tests in the transmission of aerial photographs by telephone are contemplated under arrangements completed between the Army Air Service and the American Telephone and Telegraph Company. The tests, which will be from Fort Leavenworth, Kan., to New York, Chicago and San Francisco, are scheduled for the Oct. 2 maneuvers.

The pictures will be taken and developed in the air by a new process perfected at the McCook Field Laboratory, then dropped at a transmitting station at Fort Leavenworth and sent immediately by telephone to the cities named.

Brig. Gen. H. A. Drum, the commandant general of the Second, Sixth and Ninth Corps Areas, and representatives of the press will witness the test which will be handled for the Army by the Chief Signal Officer at Washington and for the telephone company by Gen. J. J. Carty of 195 Broadway, New York City.

Estimating the Crop Situation of North Carolina from the Air

Lieut. George C. McDonald and Staff Sergeant Chastnutt, stationed at Langley Field, Va., recently made a photographic flight through the Piedmont and coastal sections of North Carolina for the purpose of recording photographically the area and distribution of crops in these sections. The assignment was successfully covered in 7 hr. 10 min. flying time by 103 verticle photographs. The mission was performed at the request of the Department of Agriculture of North Carolina.

U. S. NAVAL AVIATION

Navy Air Orders

Lt. Walter I. Minogitz det. Navy Yard, Mare Island, Calif., to Nav. Air Sta., San Diego.

Capt. Lars. J. Larson det. U.S.S. Dobbin to temp. duty Nav. Aircraft Factory, Navy Yard, Phila.

Lt. (jg) Charles A. Collings, det. U.S.S. Raleigh to Naval Air Sta., Pensacola.

Ch. Mach. Zemp W. Cornwell det. Aircf. Sqdns., Setg. Flt., to Nav. Air Sta., Pensacola.

Lt. (jg) Laerence W. Curtin det. Aircf. Sqdns., Battle Flt., to Nav. Air Sta., Pearl Harbor.

Lt. (jg) John V. McElduff, uncompleted portion ords., Aug. 31, revoked, to continue duty under inst., Nav. A. Sta., Pensacola.

Ch. Boatn. John T. Sunderman det. Nav. A. Sta., Anacostia, to Aircraft Sqdns., Battle Flt.

Lt. Samuel P. Giner det. aide on staff Comdr. Aircf. Sqdns., Setg. Flt., to Bu. Aero.

Lt. William L. Peterson det. Aircf. Sqdns., Setg. Flt., to U.S.S. Raleigh.

Lt. (jg) Wendell G. Switzer det. Obs. Plans Sqdn. 6, Aircf. Sqdns., Setg. Flt., to U.S.S. Utah.

Postpones Hawaii Flight

No further attempt to make a non-stop flight from California to Hawaii will be made before January, Secretary Wilbur announced on Sept. 24.

The seaplane PB1, with which it is planned to make the flight, has been ordered sent back to the Boeing factory at Seattle from San Francisco for modifications in its engines based on recent tests and lessons learned from the performance of the PN9 planes in their unsuccessful non-stop flights.

"We still have in mind the flight to the Hawaiian Islands with this plane," Mr. Wilbur said, referring to the PB1, but he did not say definitely that the flight would be attempted.

The plane's capacity had been demonstrated, he added, and it was probable a flight to the islands would be attempted after the alterations have been made and surface craft are available to act as station ships over the course.

Air Forces, Moments, and Damping on Model of Fleet Airship Shenandoah

To furnish data for the design of the fleet airship, Shenandoah, a model was made and tested in the 8 by 8 ft. wind tunnel for wind forces, moments and damping, under conditions described in this report. The results are given for air of standard density, $\rho = 0.00237$ slugs per cu. ft. without L/v correction, and with but a brief discussion of the aerodynamic design features of the airship. This account is a slightly revised form of Report No. 195, prepared for the Bureau of Aeronautics, July 22, 1922, and by it submitted for publication to the National Advisory Committee for Aeronautics.

The report, No. 215, by A. F. Zahm, R. H. Smith and F. A. Louden, may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

PUBLISHER'S NEWS LETTER

The tenseness that the aircraft controversy is creating is one of the most significant features of the present situation. Never before in the history of the Army or Navy, we are told, has anything like the present fear and bitterness been shown toward any idea. General Patrick put his finger on the tender spot when he said that aircraft had decreased the usefulness of every other form of combat. This fact with the resulting danger to appropriations for such branches of the Army as Cavalry and Coast Artillery and battleships for the Navy has caused an onslaught to be made against anyone who has the courage to think in air terms first.

Service complications and personal animosities have served to fan the already fast burning fire of dissention. One who has reason to know his man urged that Colonel Mitchell be ordered to Washington and allowed to stay only as long as he was wanted by the President's Air Board and then sent back on the first train to the mesquite of Texas. Another, shocked by the charges emanating from Texas summed up a very important phase of the bitterness, by saying, "It simply couldn't have happened had Mitchell been a West Pointer."

* * * *

The small band of airmen, who are bearing the brunt of the attack, are bound to have every form of pressure brought to bear on them. General Patrick nearing the end of a distinguished career, has had the courage to face the combined and united disfavor of his former closest associates in the service which must have required a fearlessness greater than that any general had to exhibit in France. As is well known, and as came out at the Air Board hearings, General Patrick was appointed to succeed General Menoher as a safe, conservative and able executive who would handle the "air enthusiasts" according to the convictions he had expressed many times. To have converted such an officer to the airman point of view is not only the greatest possible evidence of the fundamental nature of air power but shows that no matter the type of mind that concentrates on this new form of combat, the outcome will be a firm conviction of its essential and predominating character.

Colonel Mitchell has laid his course and will persue it to the end. With these two leaders there will be aligned a great majority of the public and the men who understand aviation and are willing to make it their life work. AVIATION has, for nine years, favored the independence of the air work of the government. It has defended the attacks made by the older services. Long before those who are now leading the fight were convinced of the necessity of any form of self-direction, AVIATION urged the creation of a separate bureau in the Navy and a new corps in the Army. Preceding the formation of these new services there was little cause for concern by the older services for aerial warfare had not been then able to demonstrate its power. But ever since the War, the growing importance and inevitable ascendency of air power has brought down on those who were championing the cause of aviation the wrath of the military and naval establishments. This has gone so far that General Summeral of the Second Corps Area publicly classed those who favored aviation independence as enemies of the country.

* * * *

And so far as we have been able to observe, AVIATION is the only paper devoted to aeronautics that has dared to publish the point of view of airmen who wish independence. As a result it has not been looked on with favor in all official circles. But its readers have continued to grow in numbers and it has managed to maintain an independent policy.

The animosities that are being made by the present bitterness will, we hope, pass as soon as the whole air policy of the government is determined. That it will be settled in some way before Congress adjourns next year is confidently predicted. Meanwhile, the surface of the waters will be covered with white caps and possibly the undercurrents roiled. Fortunately while governmental aviation is in a state of uncertainty, the progress of commercial aviation is steadily going forward. Perhaps it will soon be possible for those who wish to see the air utilized to the maximum, to devote their efforts solely to the upbuilding of air transport and the utilization of aircraft for innumerable industrial services.—L.D.G.

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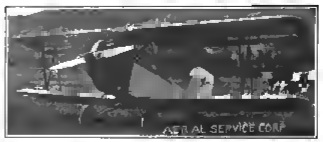

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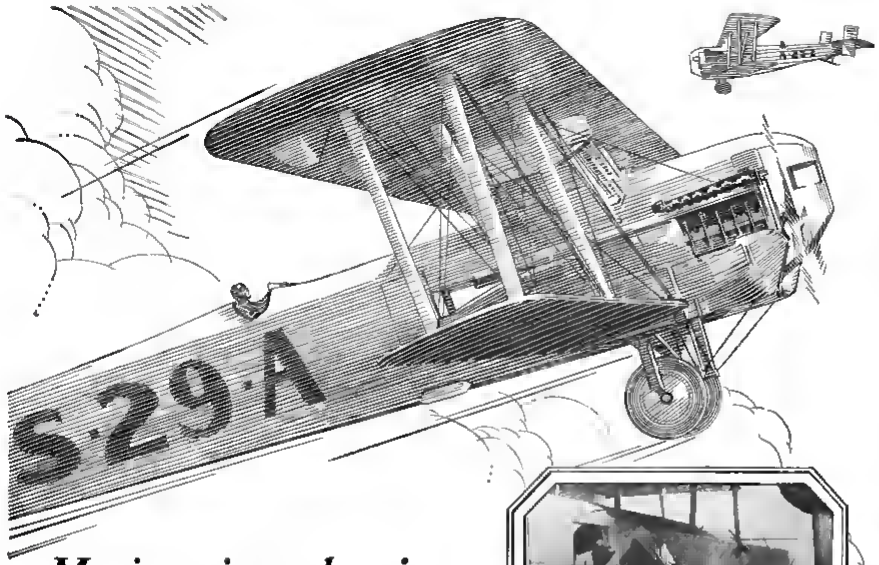

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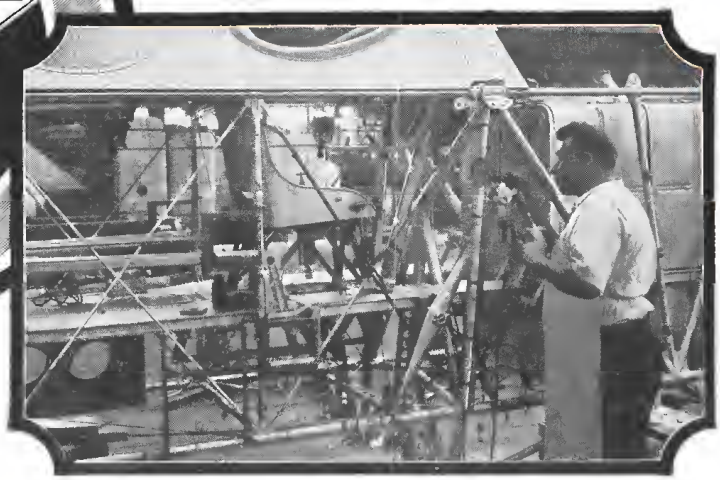

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